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Text as Data

Eastern and Central European political discourses from the perspective of computational social science – Part 1

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'Text as data': Eastern and Central European political discourses from the perspective of computational social science

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Textual data in the analysis of the political public sphere

Eastern and Central European countries have followed many different paths in the last thirty years since the fall of communism. We find examples of the strengthening of democratic institutions, the dismantling of the public sphere and civil society, right-wing and left-wing populisms, digital transformations, and disruptions brought about by the rise of online platforms. Many attempts have been made to analyse these processes: local and global dynamics of capital and field relations, historical changes in institutions, values and norms, and the challenges and ambivalences of European integration and globalisation have all offered theoretical frameworks for explaining the heterogeneity of Eastern and Central European regimes.

Studying public discourses can yield important insights into the various trends in the region. Although political discourses are always embedded in the broader context of local and international structures, institutions, values, and behaviour patterns, they also represent a distinct level of analysis. The different layers of the political public sphere (for example, parliament and political actors' communication, the media, online forums and social media platforms) are key arenas for the social construction of reality. These discursive levels are crucial for understanding the functioning of democratic and non-democratic electoral regimes; their complex structure and the interactions within them have the potential to explain political institutions, praxes, and civic culture.

All layers of the political public sphere are producing textual data in vast quantities, and the birth of computational social science opens up new perspectives for their analysis. The aim of this thematic issue is to bring together papers that profit from this new potential. The thematic issue takes a fresh look at the transforming political discourses of Eastern and Central European countries by relying on the tools of large-scale textual data analysis in the broad sense.

NLP as a social research tool

The articles in this thematic issue all approach social research problems through text analysis, using computational techniques, typically natural language processing (NLP). Although language is a crucial tool for social interaction, quantitative social research largely overlooked it for decades, mainly due to a lack of data collection and processing tools. The situation has changed radically in the last decade, with the use of textual data as an empirical social research base spreading at an exponential rate (see the 'text-as-data' movement, Gentzkow et al., 2019; Benoit, 2020). In fact, specific textual representations of all subsystems of society are being created.

These texts allow their authors to express nuanced opinions, reflect observed behaviour, and are not burdened by, for example, recollection bias, thus allowing for more valid conclusions. Online-generated data allow us to follow human behaviour in real context and real-time, which goes far beyond the traditional research methods of social scientists. While social researchers have previously had to make trade-offs between data size and depth, digitisation has made it possible to abandon such constraints.

From a social research perspective, an important feature of the new textual data asset is that penetration is widening, so digital platforms offer a way for anyone to express themselves. This is an important change, as previously the texts that were made available to the public were almost exclusively written by the elite.

In parallel with the revolution in using textual data to describe society, the last decade has seen an explosion in computing power and, in parallel, in text analytics technologies for analysing data, with new technologies providing a relevant depth of text processing. This explosion has spread from computer science and computational linguistics to computational social science, with the development of broader than domain-specific tools and models for social research.

This thematic issue provides an insight into the applications of NLP. NLP is an exciting and promising area for social research located at the intersection of computer science, artificial intelligence research and linguistics. The last decade has seen huge growth in the scientific application of NLP. It has been used in ambitious projects in health, business applications, marketing and national defence. In the last few years, NLP has also started to gain ground in the social sciences, from political science to economics and sociology.

Although NLP is a relatively new interdisciplinary field, quantitative and qualitative text analysis itself has a decades-long tradition in social research. However, traditional quantitative text analysis typically requires researchers to actually read and understand the text they are analysing. This approach started to change after the turn of the millennium. From then on, the text was not presented as an object to be read and understood but rather as an input for automated methods, without any need for actually reading it. The use of NLP in social research is therefore related to this more recent 'text-as-data' approach, where text is treated as an ordered, well-structured, numerical database that provides input for computer algorithms. Traditional quantitative text analysis tended to quantify only the appearance of certain terms or codes in texts. In comparison, the NLP toolbox is a major advance, automating tasks such as identifying the emotional load of texts, measuring the distance between texts, creating text clusters, identifying latent thematic structures or latent semantic relations, and other discursive patterns identifiable on a large scale.

The text-as-data approach in social research is primarily an alternative to opinion polls. The use of digital textual data also has methodological and epistemological advantages over deploying traditional opinion polls. The methodological advantage lies in the fact that the digital revolution has channelled opinion polling to the internet, and computational methods provide access to these vast amounts of data. The epistemological advantage stems from the fact that digital textual data are 'found data' in the sense that they are usually produced for some purpose other than scientific analysis. Therefore, unlike opinion poll data, there is no possibility of non-response. Furthermore, since opinions and interactions can be observed in their natural environment, these data reflect observed behaviour, as opposed to self-reported responses, so the views derived from them are likely to have greater internal validity, for example, as they are not subject to recall bias or social desirability bias. Other advantages include real-time availability, the potential for longitudinal analysis, and their coverage of virtually the entire population, making them useful for studying rare phenomena and hard-to-reach subpopulations. It is precisely these possibilities that are exploited in the analysis of depression forums.

We hope that this thematic issue will demonstrate that NLP represents a unique opportunity to explore regularities in texts, which can also serve as explanations for theory building. At the same time, NLP is associated with methodological pitfalls. The primary concern is that the sheer volume of data and the complexity of the methods that are used can create a false sense of reliability. It is important to stress that in most sociological applications of NLP, the use of qualitative methods is inevitable at some point in the analysis, most notably at the validation and interpretation stages. Similarly, qualitative approaches are often used to support model interpretation, as complex NLP models are difficult to interpret without going back to the original texts. Without domain-specific knowledge, NLP is a technique with little scientific value for the social sciences. Some papers in this thematic issue also illustrate this statement.

Content of the thematic issue

Our thematic issue, published in two parts (issues 2024/4 and 2025/1), consists of 11 research papers and 6 shorter contributions. From a thematic perspective, several clusters can be outlined.

Based on parliamentary debates in Hungary between 2009 and 2019, Theresa Gessler analyses the extent to which opposition parties draw on the concept of (liberal) democracy when criticising the government's policies and how democratic backsliding affects these debates.

A distinct set of articles complements these approaches by analysing similar questions through the notion of populism. Elena Cossu analyses ten Central European countries from the perspective of the populist rhetoric in electoral manifestos, creating a semantic and sentiment-based map applicable to the discursive strategies of left- and right-wing parties. Jogilė Ulinskaitė and Lukas Pukelis analyse the populist discourse of Lithuanian political parties over a 30-year period (1990–2020). Their article seeks to identify populist content in a corpus of political party manifestos, websites, and columns written by party members. Zsófia Rakovics and Ildikó Barna elaborate a case study of 'main-

streaming the extreme': the example of Jobbik, a Hungarian radical party that transformed into a centre-right party, focusing on its rhetoric and networking strategies. Through the lens of these analyses, a complex picture of Central European democratic culture emerges: while there are differences at the national and party levels, overall, it seems that thirty years after the transition, Central European democracies are in a vulnerable position.

The diagnoses concerning the vulnerability of Central European democracies can be further refined by reflecting on ongoing discursive mechanisms. One of the most dangerous potential outcomes of political polarisation and the resulting intensification of social conflict is various forms of scapegoating. Kata Knauz, Attila Varga, Zsolt Szabó and Sára Bigazzi analyse Hungarian political discourses about the Roma minority. Besides the explicit stereotypes and hostile prejudices, they attempt to detect the more subtly biased, paternalistic discourses present in the communication of parties. Rok Smrdelj, Roman Kuhar and Monika Kalin Golob analyse another hotspot in contemporary identity politics, namely the debates surrounding gender. Based on Twitter posts, they attempt to map filter bubbles of anti-gender discourses. Emese Túry-Angyal and László Lőrincz also analyse similar discursive mechanisms, partly related to the technological infrastructure of algorithmic public spheres. They explore how echo chambers, homophily, and network type affect the spread of information on Facebook.

Besides ethnic minorities and gender, one of the main issues implying scapegoating is the semantics of nationhood. Several articles explore how geopolitical discourses construct national identity in opposition to external others (i.e., foreign countries). Áron Szalay and Zsófia Rakovics analyse the enemy images appearing in the speeches of Viktor Orbán, the prime minister of Hungary. Besides mapping the range of abstract (e.g., migrants) and concrete (e.g., Soros, Brussels) enemies, they explore discourses of fearmongering in detail. According to Radu M. Meza and Andreea Mogoș, generating fear and loathing is not a rare tendency in Central European political discourses. In their analysis of the headlines of *Sputnik News* (distributed in Poland, Romania, and the Czech Republic), they mapped the discursive strategies and the affective framing that appeared in the communication of a Russian government-financed news agency. In a similar spirit, Ilya Sulzhytski and Varvara Kulhayeva analysed Belorussian Telegram channels from the perspective of their interpretation of the Ukrainian invasion. Besides mapping the main discursive panels, they also demonstrate that local pro-government activists are central channels for creating and disseminating hatred towards Ukrainians in Belarus. Although the impact of war is the most tangible in the present, collective traumas also linger in collective memory. Renáta Németh, Eszter Katona, Péter Balogh, Zsófia Rakovics, and Anna Unger explore, through parliamentary debates, the discourses surrounding the Carpathian Basin, a central metaphor for a collective identity anchored in the narratives of historical Hungary.

Besides the original research articles, the thematic issue also includes some shorter reflections introducing specific challenges of natural language processing research. Miklós Sebők, Csaba Molnár, and Anna Takács address the difficulties of building an appropriate dataset, discussing the construction of a dataset of parliamentary speeches, bills, and laws for Czechia, Hungary, Poland and Slovakia from the early 1990s to the 2020s. Zsófia Rakovics and Márton Rakovics provide a critical methodological analysis of large language models, exploring how they can be used to extract information about different

groups of society and utilised as data providers by acting as virtual respondents. In a similarly critical manner, Renáta Németh and Domonkos Sik summarise some methodological conclusions from natural language processing research: they argue that topic models need to be complemented with hermeneutic tools during the interpretative process. Tamás Varga reviews a book that can serve as a guide to using computational text analysis to learn about the social world, *Text as Data: A New Framework for Machine Learning and the Social Sciences* (by Justin Grimmer, Margaret E. Roberts, and Brandon M. Stewart). In another book review, Mohammad Ashraful Alam writes about the book *Natural Language Processing in the Real World: Text Processing, Analytics, and Classification*, written by Jyotika Singh, which is a practical guide for building natural language processing solutions. In addition to the articles above, the thematic issue also contains a short data note concerning a comparative analysis of information society in Central and Eastern Europe by Árpád Rab, Tamás Szikora and Bernát Török. Findings reveal both regional commonalities and distinct national attitudes towards online manipulation, social media usage, and the impact of internet communication on personal relationships.

Although the various contributions focus on different fields and rely on different methods, the authors share a common ambition. Computational social science opens up new possibilities for research on Central European public spheres. However, in order to fully tap the inherent potential of the emerging datasets and methods, there is a need to link the existing insights of the social sciences (originating from non-NLP analyses) with the new ones. Only in this way can the trap of 'methodological fetishism' be avoided so computational social science can be integrated into the broader process of exploring discursive dynamics in a meaningful manner. Our thematic issue is a step in this direction.

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Elena Cossu

Application of Natural Language Processing to the electoral manifestos of parties characterised by populist rhetoric in Central and Eastern Europe

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Abstract

The aim of this paper is to find patterns regarding the rhetoric employed by actors characterised by populist rhetoric in Central and Eastern Europe (CEE). To do so we examine all available electoral manifestos of all parties in CEE during the 2000–2022 period and we use Natural Language Processing with the goal of extracting meaning from a large number of texts. The analyses focus on most frequent topics using Topic Modelling, whether the manifestos express positive or negative emotions using Sentiment Analysis, and on the analysis of word frequencies. The analysis reveals a complex landscape characterized by both common themes and country-specific variations for what concerns populist rhetoric remove in the region. Populist parties consistently employ more negative sentiments in their manifestos compared to non-populist parties, regardless of being right-wing or left-wing. While they share overarching themes such as anti-EU sentiment, critiques of economic liberalism, religious and ethno-centric language, and anti-corruption narratives, populist parties skilfully tailor their rhetoric to specific national contexts and historical narratives. This adaptability allows them to resonate more effectively with local electorates. The use of negative rhetoric is a tactical choice across the populist spectrum rather than an indicator of ideological radicalism. Notably, populist parties often frame the EU as an obstacle to national sovereignty and economic prosperity while simultaneously acknowledging its benefits. The effectiveness of populist rhetoric appears to be influenced by each country's economic and institutional context, with countries investing in productivity- and innovation-led growth providing less fertile ground for divisive populist messages.

Keywords: natural language processing; political parties; electoral manifestos; populism; sentiment analysis; Central and Eastern Europe

1 Introduction

Political science has witnessed a growing relevance of Natural Language Processing (NLP) in recent years. This computational approach enables researchers to process and analyze vast corpora of documents with unprecedented precision and quantitative rigor. In this

paper, we harness the power of NLP to examine the content of manifestos from parties characterized by populist rhetoric in Central and Eastern Europe (CEE). Our study employs a range of NLP techniques, including Weighted Log Odds Ratio, Sentiment Analysis, and Topic Modelling, to provide a comprehensive yet precise analysis of these manifestos. By doing so, we aim to offer valuable insights into the nature and content of populist rhetoric in the CEE region. This paper systematically investigates these manifestos through three research questions:

(i) Do parties characterized by populist rhetoric demonstrate a convergence of topics across CEE?
(ii) Is there a convergence of sentiments among parties characterized by populist rhetoric across CEE?
(iii) To what extent and in what ways are the topics associated with populist rhetoric in the literature reflected in these manifestos?

Table 1 outlines these research questions and the corresponding methodologies employed to address each one, together with a summary of the results. Before delving into the analysis and discussion, we provide a conceptual framework for the problem at hand. We then describe our data and methodology, followed by an exploratory data analysis. The paper concludes with a summary of our findings and their implications for understanding populist rhetoric in Central and Eastern Europe. By leveraging these NLP techniques, this study contributes to the growing body of literature on populism and political communication in CEE.

The findings reveal that, despite considerable variation tied to specific national contexts, populist parties consistently employ negative sentiments more frequently than non-populist parties. Themes such as anti-EU sentiment, critiques of economic liberalism, religious and ethno-centric language, and anti-corruption narratives are prevalent among these parties. The adaptability of populist rhetoric, tailored to resonate with local electorates, emerges as a notable strategy. This rhetorical flexibility allows populist parties to capitalize on historical narratives and societal cleavages, enhancing their electoral appeal across different countries.

The analysis highlights that populist rhetoric is marked by negative sentiment, regardless of whether the parties are centrist or radical. Specific thematic trends also emerge, such as the frequent portrayal of the EU as an impediment to national sovereignty and economic prosperity. Interestingly, there was no significant difference in the intensity of negative rhetoric between centrist and radical populists, suggesting that the use of negative sentiment is a tactical choice rather than an indicator of ideological extremism. Additionally, the common themes reflected in populist manifestos indicate a convergence towards certain key issues, though the manifestation of these themes varies according to each country's unique historical, economic, and social context.

Table 1 Research questions and methodology

Research Question	Methodology	Result
Whether parties characterised by populist rhetoric have a convergence of topics	Weighted Log Odds Ratio, Topic Modelling	Preference for certain CEE populist cleavages for certain populist parties, mainly the radical ones.
Whether parties characterised by populist rhetoric have a convergence of sentiments	Sentiment Analysis	More negative sentiments toward the EU for countries characterised by populist rhetoric. More negative sentiments for populist parties but no relevant difference between centrist and radical ones.
Whether and in which way the topics traditionally used by populist rhetoric actors in CEE are reflected in the manifestos	n-grams, Topic Modelling	Common use of anti-EU rhetoric, but different cleavages exploited according to the party.

2 The use of populist rhetoric in CEE

Exploring the use of populist rhetoric in Central and Eastern Europe (CEE) is crucial for understanding its impact on political institutions and governance. Populism, widely studied in recent years, is predominantly defined as a 'thin-centred ideology that considers society to be ultimately separated into two homogeneous and antagonistic groups, "the pure people" versus "the corrupt elite", and which argues that politics should be an expression of the volonté générale (general will) of the people' (Mudde, 2004, p. 543). This ideology is characterized by people-centrism, anti-elitism, and Manichaean thinking, along with a preference for anti-institutionalism and emotionalized crisis narratives. The impact of populist rhetoric on political institutions has been subject to considerable debate, with some arguing for its potential positive effects (Mouffe, 2019). However, there is a broad consensus that its effect in Europe, particularly in CEE, is predominantly negative (Bartels, 2023; Funke et al., 2020).

In CEE, populist rhetoric is viewed as a means to foster illiberal governance through centralization, politicization of the state, and various forms of anti-pluralism (Boda, 2024). This is achieved by exerting pressure on critical media, violating minority rights, undermining key institutions, and constraining opposition (Mounk, 2018). In the libertarian-authoritarian dimension of the political space (Kitschelt, 1994), populist rhetoric is utilized in CEE to shift from the 'Green/alternative/libertarian' (GAL) side to the 'traditional/authoritarian/nationalist' (TAN) side (Hooghe et al., 2002). The drivers of populist rhetoric in CEE are multifaceted, including economic factors such as dissatisfaction with the economy and economic insecurity (Guiso et al., 2017), as well as low trust in political institutions (Győrffy, 2009). Kriesi (2014) argues as well that the limited institutionalization of party systems and perceived corruption among public officials contribute to this phenomenon.

In CEE, populist support can be divided into 'centrist populism' and 'radical populism' (Petrović et al., 2022). We use this division as well to see potential archetypes of populist rhetoric. While centrist populism primarily exploits dissatisfaction with corrupt leaders, radical populism represents a backlash against post-communist transition politics and the elites responsible for implementing those reforms. For the latter group, populist rhetoric is used to challenge democratic norms and institutions, rejecting pluralism and appealing to an ethnically and culturally homogeneous 'people' (Spasojević, 2020). Given the success of populist rhetoric in the region, with more than half of the 11 post-communist EU member states ruled by populist prime ministers by the end of 2020 (Petrović et al., 2022), it is crucial to analyse the rhetoric of parties characterized by populist tendencies across CEE in comparison to non-populist parties and among different groups of populist parties.

3 NLP in the literature on populism and the democratic process

The influence of populist discourse and rhetoric on opinion formation and subsequent electoral outcomes in Central and Eastern Europe (CEE) has been a subject of extensive research (Hawkins et al., 2019). To comprehend the content of this rhetoric, researchers increasingly employ large-scale textual analysis. Natural Language Processing (NLP), a multifaceted field encompassing various methodologies for machine-based human language analysis, enables researchers to quantitatively examine substantial volumes of data.

NLP plays a pivotal role in analysing the content of text documents and populist rhetoric. By employing techniques such as topic modelling and sentiment analysis, researchers can identify patterns and sentiments expressed in populist discourse, particularly on social media platforms where populist parties frequently disseminate their messages.

The application of NLP in political research underscores its potential for enhancing our understanding of societal divisions and the dynamics of political discourse. It suggests the need for integrating explanatory and predictive modelling paradigms, as well as fostering a more interdisciplinary approach to studying the political process. This approach acknowledges the complexity of political dynamics, which are influenced by myriad factors beyond the content of political speeches or social media posts.

The utilization of NLP in political research, especially with manifestos, is a relatively recent development. One of the seminal applications of NLP to electoral manifestos was conducted by Slapin and Proksch (2008). Traditionally, NLP analysis of manifesto documents focused primarily on OECD and English-speaking countries (Merz et al., 2016). However, this trend is shifting due to increased data availability, enhanced computational capabilities, and the growing popularity of large language models. Given the recency of this shift, research on manifestos in CEE has been predominantly qualitative (Landman, 2016). This field has tended to focus on the dichotomy between 'the East' and 'the West' (Haughton, 2013) or country-level case studies (Ulinskaitė & Pukelis, 2021). However, contemporary NLP-based studies in CEE encompass a wide range of topics, including the role of spending (Coman, 2019), the effect of fringe parties on mainstream parties (Heinisch et al., 2021), and the main themes of social democratic parties (Bielik, 2020).

Research employing NLP on manifestos regarding populism is also gaining traction. A notable example is the work of Di Cocco and Monechi (2022), who utilize a combination of NLP and supervised machine learning to measure the degree of populism in manifestos. Other studies have examined populist rhetoric via social media (Gründl, 2020; Hirzalla, 2019), political debates (Klamm et al., 2023), and journal content (Naxera et al., 2023). Additionally, numerous studies employ NLP to measure polarization (Németh, 2023). This growing body of NLP-based research in political science, particularly in the context of CEE, demonstrates the increasing recognition of the method's potential to provide nuanced insights into political discourse and its societal impacts.

4 Methodology

This paper employs a subset of NLP methodologies known as Natural Language Understanding (NLU). While NLP is the overarching field that encompasses a variety of tasks related to the processing and generation of human language by computers, NLU specializes in understanding the meaning and intent behind language. NLU techniques can help us provide a more systematic insight into the rhetoric of populist parties in CEE. Their systematic nature can also help us gain a comprehensive overview of the problem without the drawbacks often associated with qualitative analysis of manifestos (Lacy et al., 2015). For the purpose of this analysis, we utilize at least one methodology from each of the five NLU families of methodologies (Lo et al., 2023), as summarized in Table 2. We also perform the analysis using R 4.4.0 and the Tidyverse 2.0.0 and Quanteda 4.0.2 packages.

Table 2 Used methodologies in relation to NLU

NLU Methodologies Family	**Method Used in This Paper**
Rule-based systems	Sentiment Analysis
Statistical methods	n-grams, Weighted Log Odds Ratio
Machine learning approaches	Topic Modelling
Machine learning approaches	Machine Translation

Two of the methodologies employed in this study are derived from the Natural Language Understanding (NLU) subgroup known as 'rule-based systems'. These methodologies rely on handcrafted linguistic rules and patterns to extract information from text. Specifically, we use dictionaries – lists of words with assigned values – as a methodology from this group. Despite criticisms of dictionaries for their context insensitivity, they remain a valuable approach for obtaining overall measurements of certain constructs. For each document used we remove stop words by removing the 1149 stop words already categorised in English in the R Tidytext package and we also remove the dictionary words followed or anticipated by a negation using a regex expression.

We utilize dictionaries such as the Populism Dictionary (Benoit & Nulty, 2014) and the Liberalism Dictionary (Laver & Garry, 2000) to gauge the prevalence of populist rhetoric across different groups. The Populism Dictionary uses the dictionary argument with the dfm function of the Quanteda package, where a list of terms associated with populist language are categorized based on Rooduijn and Pauwels (2011). This way we find a list of populist terms in each document, and we use it to construct a score where we measure the proportion of populist and non-populist language per group of documents. Similarly, the Liberalism Dictionary extracts words connected to liberalism and creates a score (Laver & Garry, 2000).

Additionally, we employ a dictionary-based approach to sentiment analysis, which uses a predefined lexicon to assess sentiment (Young & Soroka, 2012). For this purpose, we chose the AFINN dictionary due to its suitability for general-purpose sentiment analysis, irrespective of the text source (Nielsen, 2011). We also construct a score for each document similarly to the Populism and Liberalism dictionary. Word scores range from -5 (negative) to +5 (positive). The English language dictionary includes 2477 coded terms that we use on the translated version of each document.

The second NLU subgroup we reference, statistical methods, involves learning patterns and probabilities associated with different linguistic phenomena. Statistical methods such as weighted n-grams and weighted log odds ratios were used for tasks like language modelling. N-grams are especially effective in specific, well-defined domains where rules can be comprehensively enumerated. In our work, we use n-grams to examine common combinations around topics like the European Union. We also employ weighted log odds ratios to compare term importance across different categories, identifying terms significantly more or less associated with specific categories. This includes analysing word frequencies across various groups and parties to align with our research questions.

Third, we leverage machine learning approaches within NLU, which rely on trained models to execute various tasks such as sentiment analysis, named entity recognition, and text classification. Topic Modelling (TM), a technique for identifying predominant themes within a text, is part of this group. This approach clusters text segments into distinct groups or categories based on shared vocabulary, using an unsupervised machine learning model. The most well-known algorithm for Topic Modelling is the Latent Dirichlet Allocation (LDA), that we apply using the R Quanteda package. TM operates on two fundamental principles: it considers each document as a mix of various topics and associates every word with at least one topic. In our analysis, we employ Structural Topic Modelling (STM) with LDA, an unsupervised machine learning technique that uncovers latent themes by exploring frequent co-occurrences of words. Our objective is to infer hidden subjects in texts by examining observable connections among words. Unlike supervised machine learning methods, these topics are not predetermined.

We determine the optimal number of topics by integrating both quantitative metrics and qualitative evaluations. Quantitative metrics such as log-likelihood, perplexity, and topic coherence offered objective measures of model performance, while qualitative assessments focus on the interpretability of the resulting topics. We experiment with a range of values, evaluate their performance against these metrics, and select the number of topics that achieves an optimal balance between model fit and interpretability, which is five

in this case. We also use the default Alpha and Beta values in the model as they perform well, and they decrease their performance when fine-tuned. We also use qualitative review of our results to validate them. We use TM not only for its reliability but also because our aim is not to classify documents into predefined categories. Instead, we utilize TM to uncover and comprehend previously unrecognized themes within the texts. Specifically, we use LDA due to its interpretability and its well-established status in the literature.

5 Data

We apply the above-mentioned techniques on manifestos of parties characterised by populist rhetoric over the 2000–2022 period. The data and the categorization come from the MARPOR dataset (Volkens et al., 2019), specifically from the 2023-1 version of the corpus. We retrieve the data for CEE countries, here defined because of data availability as nine out of the eleven European Union member states with a former communist past. We chose the 2000–2022 period for two reasons. First, we want to look at the CEE democratisation period and consider the illiberal tendencies of populism in the area. Second, data before the year 2000 in the region is usually scarce and unreliable. We select all manifestos in Central and Eastern Europe for the 2000–2022 period from the Manifesto Project Database. We choose to focus on manifestos, despite their shortcomings (Volkens et al., 2009), because they are considered in the literature to provide valuable insight regarding the priorities, objectives, and intentions of political parties.

We then add metadata to each party in the database using PartyFacts (Döring & Regel, 2019) and the PopuList (Rooduijn et al., 2020). We use the PopuList to classify parties and, conversely, manifestos as characterised by populist rhetoric. The dataset categorises parties according to the academically dominant definition of populism (Mudde, 2004). Furthermore, for the purpose of this study, the identification of populist rhetoric matters only for the identification of the parties from which we should analyse the manifestos. We end up with 304 manifestos for 144 parties for the 2000-2022 period as divided in Table 3. We also identify some of these parties as centrist (GERB, ANO and OĽaNO) and radical populist (Fidesz, PiS and SDS) according to the academic definitions (Petrović et al., 2023).

Once we have obtained the data, we prepare it for analysis as summarized in Figure 1. Particular emphasis is placed on the translation of our corpus, which is composed of texts in ten different languages, with tokenization functions available for only some of them. To translate the corpus, we use the Google Cloud Translation API. Following the translation, we perform tokenization, stemming, lemmatization, and other preprocessing steps necessary for analysing our corpus. First, tokenization is the process of splitting text into smaller units, which in our case are words. Second, stemming involves transforming words into their base forms or roots. Finally, lemmatization is the process of grouping together words with the same root. For example, lemmatization enables words like 'imaging' and 'imagination' to be categorized together. This is particularly useful for techniques such as Topic Modelling and Sentiment Analysis. Once the data are prepared using machine translation, we proceed with exploratory data analysis (EDA), followed by the application of n-grams, Sentiment Analysis, and Topic Modelling to answer the research questions.

Table 3 Number of available manifestos per country and use of populist rhetoric with time range

Country	Manifesto Type	Number of Parties	Number of Available Manifestos	Avg. Characters Sentence Length	Avg. Characters Document Lenght	Time Span
BGR	Non-Populist	7	10	101.15	26289.87	2009/07 – 2017/03
BGR	Populist	5	10	107.60	239202.11	2009/07 – 2017/03
EST	Non-Populist	7	21	109.44	102343.35	2007/03 – 2019/03
EST	Populist	1	2	111.79	25462.40	2007/03 – 2011/03
HRV	Non-Populist	24	45	133.52	159387.14	2000/01 – 2020/07
HRV	Populist	4	9	150.86	165715.24	2000/01 – 2020/07
HUN	Non-Populist	9	19	90.55	307470.96	2002/04 – 2018/04
HUN	Populist	2	11	91.19	289176.93	2006/04 – 2018/04
LTU	Non-Populist	17	33	125.67	308816.44	2000/10 – 2020/10
LTU	Populist	4	9	114.53	89053.34	2004/10 – 2020/10
LVA	Non-Populist	15	28	65.39	9500.00	2006/10 – 2018/10
LVA	Populist	2	2	62.80	4421.22	2006/10 – 2011/09
POL	Non-Populist	15	25	108.99	151799.44	2001/09 – 2019/10
POL	Populist	3	6	136.56	503643.64	2001/09 – 2019/10
SVK	Non-Populist	6	16	133.86	144070.87	2002/09 – 2016/03
SVK	Populist	8	17	142.21	210947.15	2002/09 – 2016/03
SVN	Non-Populist	13	32	121.40	246798.47	2004/10 – 2018/06
SVN	Populist	2	9	128.75	228082.51	2004/10 – 2018/06

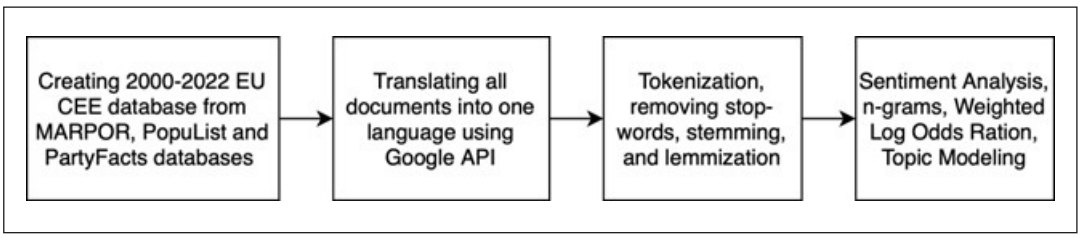

Figure 1 Analysis steps

6 Exploratory data analysis

In this study, we aim to examine potential differences in the rhetoric and language used across distinct groups of political parties. Our primary focus is on comparing populist Central and Eastern European (CEE) parties with their non-populist counterparts. Additionally, we differentiate between 'centrist populists', such as GERB in Bulgaria, OL'aNO in Slovakia, and ANO in the Czech Republic, and 'radical populists', including Fidesz in Hungary, PiS in Poland, and SDS in Slovenia. This comparative analysis is essential for understanding the varying strategies and communication styles employed by these political entities.

Our exploratory data analysis begins with a detailed examination of political manifestos. Initial findings indicate that these documents adhere to Zipf's law (Figure 6), showing no significant deviation in the frequency of common versus uncommon words. This suggests a consistent linguistic pattern across the texts. Furthermore, it is observed that the manifestos predominantly use simpler language, aligning with their intended purpose of communicating effectively with a broad audience. This simplicity in word choice underscores the strategic emphasis on accessibility and clarity in political messaging.

Subsequent analysis focused on identifying patterns in the most frequently used words across the political manifestos. An examination of word usage across different countries did not reveal any distinct patterns, as demonstrated in Figure 7. Commonly used words were typically related to politics and political manifestos, reflecting the similar structure and nature of these documents. In many countries, variations of the word 'development' emerged as the most frequently used term. However, when comparing the probability of word usage between populist and non-populist parties, no discernible pattern was found (Figure 8), with the notable exception of the term 'colonial' in the context of Bulgaria. This suggests that while there are similarities in language usage across political manifestos, specific contextual factors may influence word choice in certain instances.

When examining the log odds of word usage between populist and non-populist parties across the entire region, and particularly among electorally successful parties, distinct patterns emerge (Figure 2). Specifically, we focus on three parties characterized by populist rhetoric that are currently in power and classified as 'extremist populists': Fidesz in Hungary since 2010, PiS in Poland since 2015, and GERB in Bulgaria since 2009. These examples of radical populists appear in the second, third, and fourth panels of Figure 2, respectively. Their political success and populist strategies provide critical insights into the language patterns that differentiate them from non-populist parties.

In Hungary, the Fidesz party not only exploits existing societal cleavages associated with populist rhetoric in Europe but also employs more negative terminology, such as 'attack'. Additionally, Fidesz often rejects liberal values through religious references, using words like 'holy' and 'Sunday'. This phenomenon mirrors well-documented mechanisms in the populist literature, where populist parties frequently invoke religious and moralistic language to bolster their ideological stances. These linguistic choices underline how Fidesz capitalizes on religious sentiments to promote its political agenda.

Similarly, the PiS government in Poland demonstrates a clear embrace of anti-communist sentiment and critiques of the post-communist transition, as evidenced by its log odds analysis. In Bulgaria, the rhetoric of radical parties such as Ataka reveals a reliance

on negative terms like 'attack' and a notable prevalence of the term 'colonial'. This usage aligns with the concept of colonial liberalism, where colonial endeavours are justified through liberal principles such as economic development and moral progress. Despite being framed as a benevolent mission, it fundamentally involves the domination and exploitation of less powerful nations. This exploitation of populist rhetoric has been extensively documented in the literature and highlights how populist parties manipulate historical narratives and societal values to fortify their political objectives.

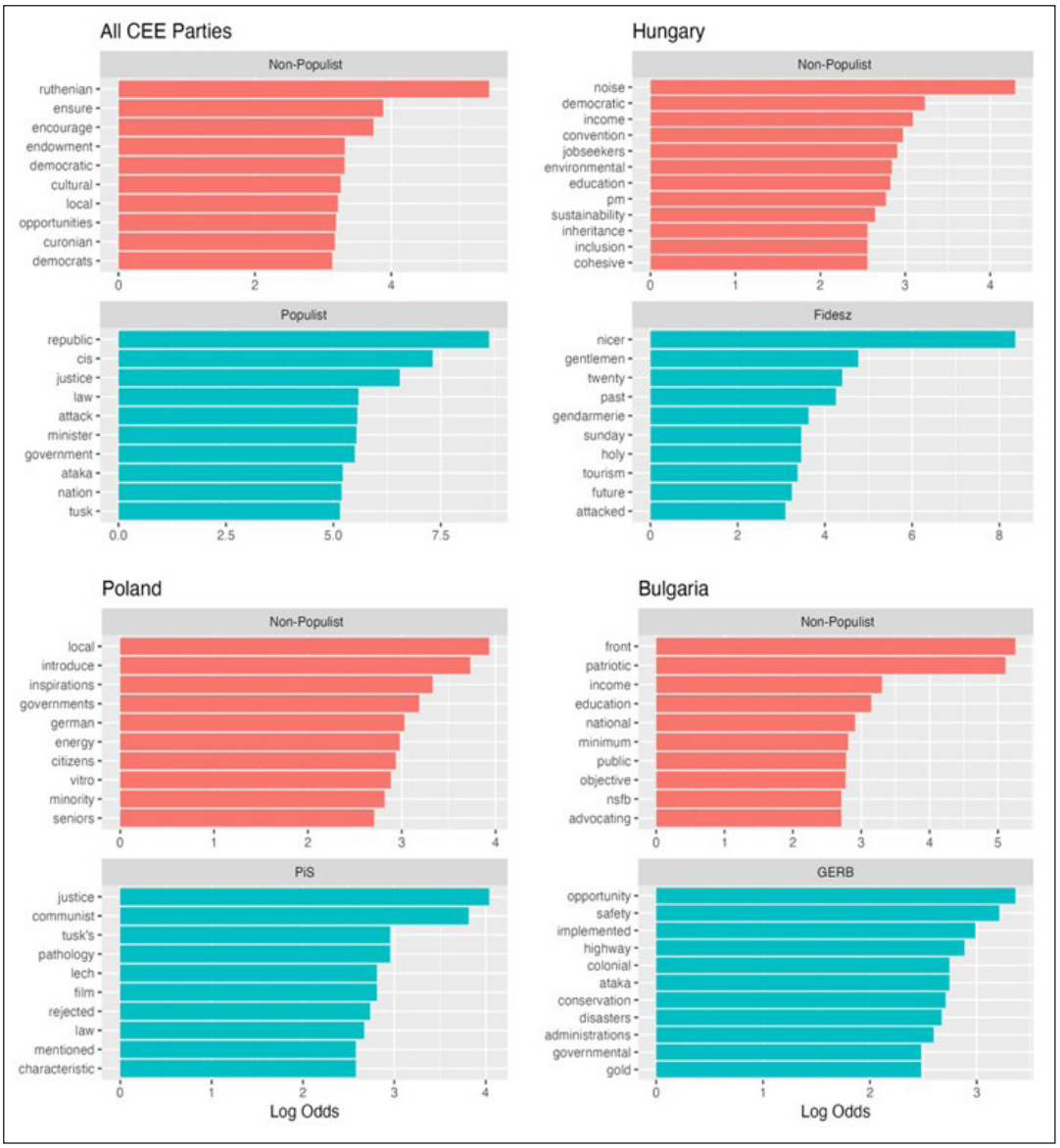

Figure 2 Log odds of using certain words for all cee countries and for selected parties

We then examine the likelihood that these parties use specific words compared to other parties within the same country (Figure 5). Words positioned closer to the central line indicate an equal likelihood of being used by both populist and non-populist parties. Conversely, words farther from the line are more likely to be used predominantly by one group or the other. This analysis focuses on parties characterized by populist rhetoric, based on the assumption that once such a party is in power, its rhetoric becomes increasingly polarizing to garner further electoral support. Consistent with prior research (Swallow, 2018), we observe specific thematic trends overall and for representative radical and centrist populist parties. In Figure 9 we report the results for the overall likelihoods and the ones for exemplary centrist populist parties. Here (Figure 3), we report only the results of the representative radical right populists for relevance. For Fidesz, prevalent themes include communism, immigration, multinationals, censorship, truth, and Europe, with less emphasis on family than anticipated. These findings highlight the existing societal cleavages identified in the literature, especially the rejection of liberalism in Hungary and the use of negative language in Bulgaria. Surprisingly, we did not observe any distinct patterns for the PiS party in Poland using this methodological approach.

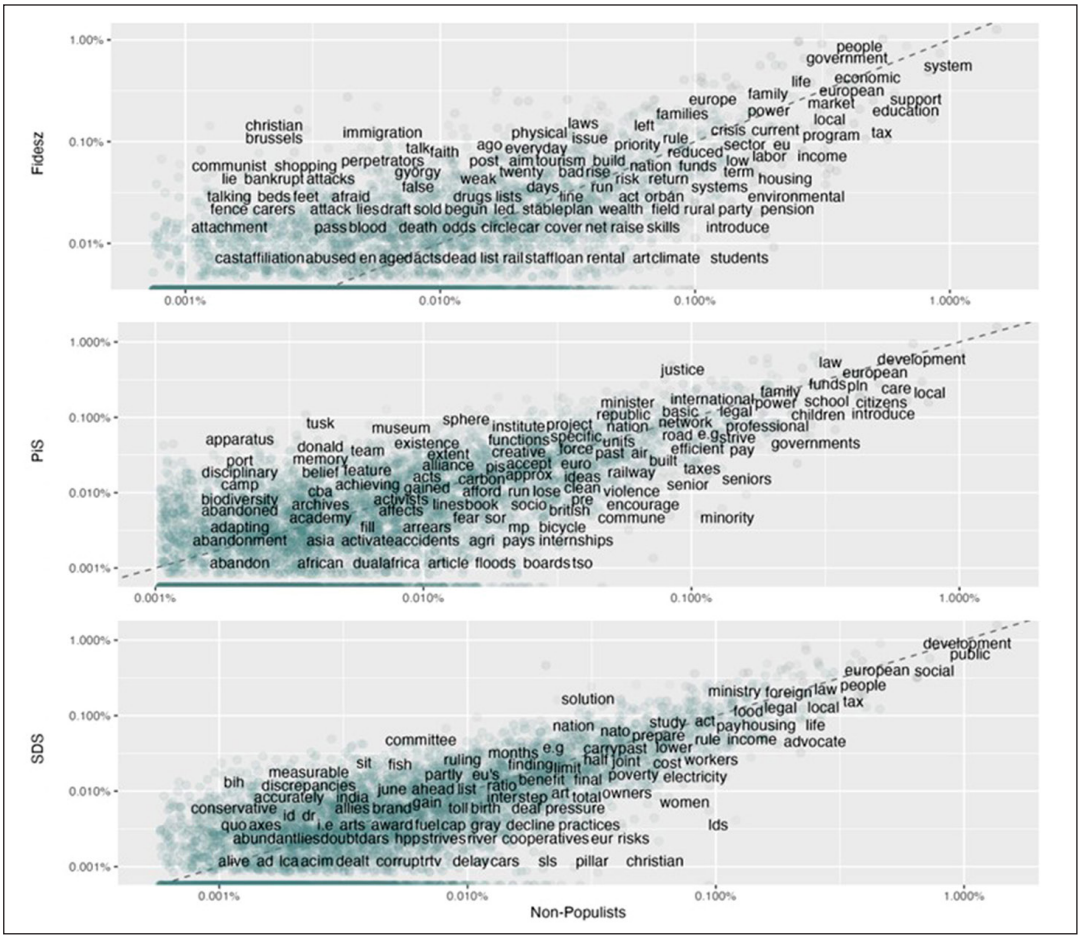

Figure 3. Likelihood to use certain words compared to parties with similar rhetoric for selected parties

We further expanded our exploratory data analysis by using specialized dictionaries for populism and liberalism, as mentioned in the methodology section (Table 4). This analysis revealed varying levels of populism and liberalism across the selected groups of parties. However, we did not conduct the same analysis by distinguishing between centrist and radical populist parties, primarily because not all countries in our dataset have representative parties in each of these subgroups. Additionally, we did not find significant differences between the centrist and radical populist parties that were present in the dataset. This suggests that the distinctions in rhetoric between different types of populist parties may not be as pronounced as previously thought or that other contextual factors may play a more significant role.

Table 4 Dictionaries results per country group

Country	Manifesto Type	Populism Dictionary	Liberalism
BGR	Non-Populist	0.10	0.90
BGR	Populist	0.09	0.91
EST	Non-Populist	0.05	0.95
EST	Populist	0.11	0.89
HRV	Non-Populist	0.10	0.90
HRV	Populist	0.14	0.86
HUN	Non-Populist	0.08	0.92
HUN	Populist	0.10	0.90
LTU	Non-Populist	0.08	0.92
LTU	Populist	0.13	0.87
LVA	Non-Populist	0.10	0.90
LVA	Populist	NA	NA
POL	Non-Populist	0.08	0.92
POL	Populist	0.10	0.90
SVK	Non-Populist	0.07	0.93
SVK	Populist	0.10	0.90
SVN	Non-Populist	0.06	0.94
SVN	Populist	0.07	0.93

Source: The Manifesto Project.

6 Results

In this discussion section, we will analyse the results of our comparative study on non-populist, populist radical, and populist centrist parties across various countries, focusing on sentiment analysis, n-grams, and topic modelling. Our sentiment analysis reveals intriguing patterns across the different party groups. A closer examination of individual manifestos shows that five of them are populist. However, this broad view does not immediately highlight significant differences between party types. Notably, the ATAKA party stands out for its particularly negative sentiment (Table 5).

When we disaggregate the data by country and party group, more distinct patterns emerge (Table 6 and Table 7). On average, populist parties employ more negative sentiments compared to their non-populist counterparts. This trend is consistent across both centrist and radical populist parties, suggesting that negativity is a common feature of populist rhetoric regardless of ideological positioning on the left-right spectrum.

Interestingly, we observed more negative sentiments associated with specific cleavages, particularly concerning Europe (Figure 4). However, this pattern did not extend to other potentially divisive terms such as 'west', 'liberalism', or 'communism'. Moreover, we did not find substantial differences in sentiment between representative centrist and radical populist parties, indicating that the intensity of populist rhetoric may not necessarily correlate with ideological extremism.

Our n-gram analysis, as illustrated in Figure 5, reveals distinctive linguistic patterns between parties that employ populist rhetoric and those that do not. Words like 'Brussels', 'absorption', 'lies', and 'cancel' are more prevalent in populist party manifestos. These findings align with three key aspects of populist rhetoric: (1) the creation of division, (2) the portrayal of European institutions as oppressors (particularly in Central and Eastern Europe), and (3) the self-presentation of populist actors as defenders of traditional values against perceived liberal or 'woke' culture.

It is worth noting that despite these differences, there is a 97 per cent Pearson correlation between the manifestos of parties using populist rhetoric and those that do not. This suggests that while populist parties may employ distinctive language, they still operate within a broadly similar political discourse. Interestingly, we did not observe significant differences in n-gram usage between representative centrist and radical populist parties, indicating that the intensity of populist rhetoric may not be a reliable indicator of ideological positioning.

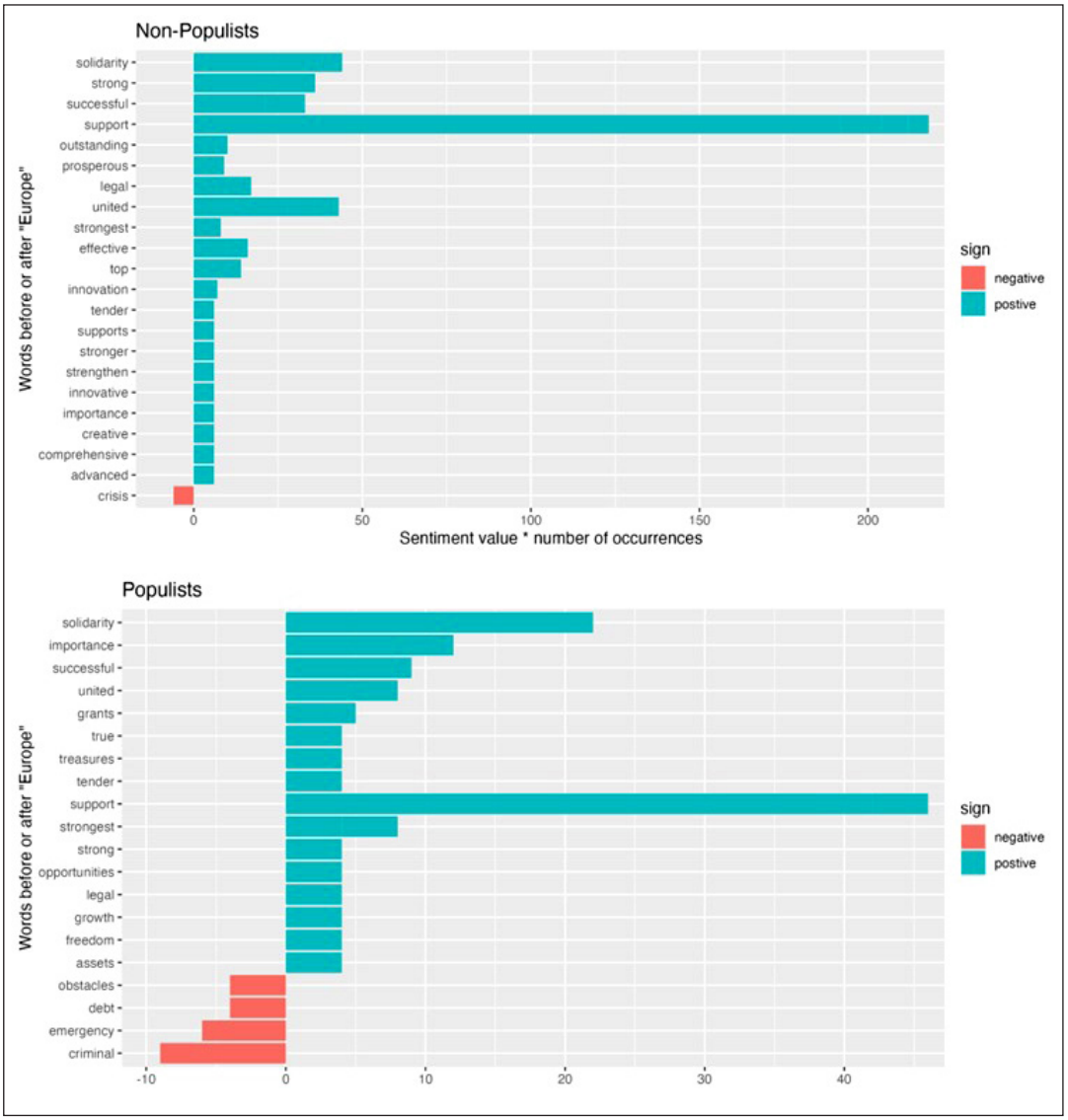

Figure 4. Words divided by sentiment connected to 'EU', parties using populist rhetoric vs. parties not using it

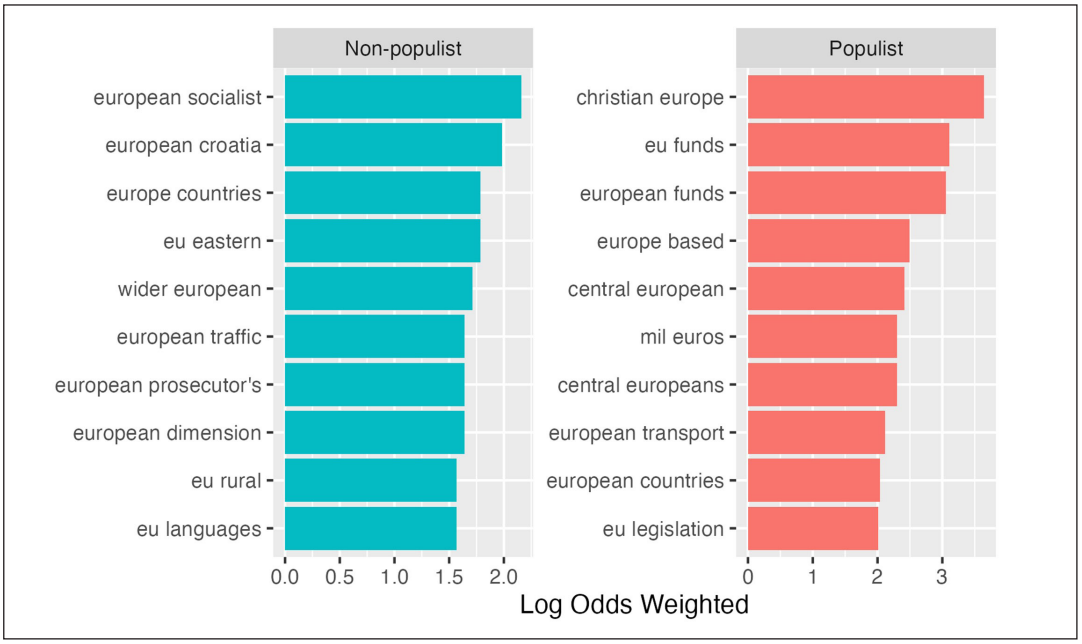

Figure 5. Most common words used together with 'EU' by weighted log odds, parties using populist rhetoric vs. parties not using it

Our Topic Modelling analysis, using Latent Dirichlet Allocation (LDA), reveals further nuances in the discourse of different party groups (Table 8). Non-populist parties across countries generally focus on conventional political topics such as economic, social, and infrastructure development. However, there are notable exceptions, such as the Polish non-populist parties' focus on Germany and Hungarian non-populists' frequent mentions of Fidesz, reflecting the polarized political landscape in these countries.

Populist parties, on the other hand, exhibit more diverse and often controversial topics. In Bulgaria, we observe themes of liberal colonialism and anti-Roma sentiment alongside economic development. Hungarian populist discourse centres on Christian values as a form of rebellion against liberalism, anti-immigration rhetoric, and anti-Soros campaigns. Polish populist parties focus significantly on former Prime Minister Donald Tusk, while Slovak populist discourse combines Christian and anti-immigrant themes despite the success of the more centrist OL'aNO party.

Interestingly, Slovenia presents a counterintuitive case. Despite the success of the radical populist SDS party, the overall populist discourse in the country appears more moderate. Croatia, Estonia, and Lithuania show the least focus on typical populist cleavages, which aligns with the absence of prominent centrist or radical populist parties in these countries.

When comparing country-level topics with those of influential populist parties (Table 9), we find varying degrees of overlap. In Hungary, Fidesz's narrative closely mirrors the overall populist discourse, suggesting its dominance in shaping the country's political rhetoric. Similarly, PiS in Poland shows significant overlap with the broader

populist narrative. The SDS in Slovenia maintains a surprisingly moderate tone despite its radical populist classification. GERB in Bulgaria and OL'aNO in Slovakia focus on anti-corruption themes, while ANO in Czechia emphasizes immigration issues while maintaining a relatively traditional political tone.

In conclusion, our analysis reveals complex patterns in the rhetoric of populist and non-populist parties across Central and Eastern Europe. While populist parties generally employ more negative sentiment and distinctive language, the intensity of populist rhetoric does not always correspond to ideological extremism. Furthermore, the specific themes and topics addressed by populist parties vary considerably across countries, reflecting diverse national contexts and political strategies.

7 Discussion

This study aimed to examine the rhetoric employed by parties characterized by populist tendencies in Central and Eastern Europe (CEE), comparing them with non-populist counterparts and distinguishing between 'centrist populists' and 'radical populists'. Our analysis, utilizing Natural Language Processing techniques such as sentiment analysis, n-grams, and topic modelling, reveals complex patterns in the political discourse across the region. The findings provide insights into the convergence of topics and sentiments among populist parties, the reflection of populist themes in party manifestos, and the varying strategies employed by different types of populist parties.

Our first research question sought to determine whether parties characterized by populist rhetoric demonstrate a convergence of topics across CEE. The analysis reveals both commonalities and divergences in the discourse of populist parties. While there are overarching themes that appear consistently, such as anti-EU sentiment and critiques of economic liberalism, the specific manifestations of these themes vary significantly across countries. For instance, in Bulgaria, the concept of 'colonialism' emerges as a distinctive feature of populist rhetoric, particularly employed by parties like ATAKA. This narrative frames the influence of global and EU forces as a form of 'neo-colonialism', exploiting cultural dominance and inter-regional economic dependence. In contrast, Hungarian populist discourse, exemplified by Fidesz, centres on Christian values as a form of rebellion against liberalism, coupled with anti-immigration rhetoric. Polish populist parties, particularly PiS, focus significantly on criticising former Prime Minister Donald Tusk and the perceived failures of the post-communist transition. These findings suggest that while there is some convergence in broad themes, populist parties in CEE are adept at tailoring their rhetoric to specific national contexts and historical narratives. This adaptability allows them to resonate more effectively with local electorates, potentially contributing to their electoral success.

Regarding the convergence of sentiments, our second research question, the analysis reveals a clear trend: populist parties consistently employ more negative sentiments compared to their non-populist counterparts. This tendency is observed across both centrist and radical populist parties, indicating that negativity is a common feature of populist rhetoric regardless of ideological positioning on the left-right spectrum. Notably, parties like ATAKA in Bulgaria stand out for their particularly negative sentiment. However, it is

important to note that while the overall trend shows more negative sentiment in populist discourse, the intensity of this negativity does not necessarily correlate with ideological extremism. We did not find substantial differences in sentiment between representative centrist and radical populist parties. This suggests that the use of negative rhetoric is a tactical choice employed across the populist spectrum rather than a marker of ideological radicalism.

Our third research question aimed to explore the extent to which topics traditionally associated with populist rhetoric in CEE are reflected in party manifestos. The analysis reveals that several key themes consistently emerge, aligning with existing literature on populist discourse. Anti-EU sentiment emerges as a frequent target in populist manifestos. Parties often frame the EU as an obstacle to national sovereignty and economic prosperity. The phrase 'European Union' is the most common combination of words in parties that use populist rhetoric. This narrative often portrays the EU as failing to deliver on the promised economic convergence, creating an ambivalent relationship where parties simultaneously claim adherence to European values while resenting perceived economic dependence. The critique of economic liberalism is another prominent theme in populist manifestos. Populist parties frequently portray economic liberalism as a failed ideology that has not delivered on promises of prosperity and convergence with Western Europe. This narrative is often personified through figures like Donald Tusk in Poland or George Soros in Hungary. The critique of economic liberalism is intertwined with anti-globalization sentiment, appealing to those who feel left behind by economic changes.

Religious and ethno-centric rhetoric is also prevalent, particularly in countries like Hungary and Slovakia. Many populist parties employ religious and ethno-centric language to create divisions and portray liberalism and European integration as threats to traditional values. This approach often involves invoking Christian values and national identity as bulwarks against perceived external threats. While not universally prominent across all CEE countries, anti-immigration rhetoric features strongly in some populist discourses, particularly in Hungary. This theme often intersects with discussions of national identity and cultural preservation. Anti-corruption and anti-establishment themes are especially prevalent among centrist populist parties, positioning themselves as forces for change against a corrupt elite. This narrative allows these parties to appeal to a broader electorate by presenting themselves as reformers rather than radicals. It is noteworthy that the manifestation of these themes varies across countries. For instance, Slovenia presents a counterintuitive case where, despite the success of the radical populist SDS party, the overall populist discourse appears more moderate. Similarly, countries like Croatia, Estonia, and Lithuania show less focus on typical populist cleavages, which aligns with the absence of prominent centrist or radical populist parties in these countries.

The variations in populist rhetoric across CEE countries reflect different historical, economic, and social contexts. Some scholars argue that the rise of populism in the region is a response to the perceived failures of post-communist transitions and the unfulfilled promises of economic liberalism and EU integration. From this perspective, populist rhetoric serves as a voice for those disillusioned with the outcomes of these processes. However, critics argue that populist parties exploit and exaggerate these grievances, creating artificial divisions and scapegoats rather than addressing underlying structural issues. The use of religious and ethno-centric rhetoric, for instance, may be seen as a strategic

choice to mobilize support rather than a genuine reflection of societal values. The success of populist rhetoric in some countries (e.g. Hungary, Poland) compared to others (e.g. Estonia) may be linked to different policy approaches and institutional strengths. Countries that have invested in productivity- and innovation-led growth seem to provide less fertile ground for divisive populist rhetoric. This suggests that the economic and institutional context plays a crucial role in determining the resonance of populist messages. The ambivalent relationship with the EU, as reflected in the manifestos, highlights a complex dynamic. While populist parties often criticize EU institutions and policies, they simultaneously acknowledge the benefits of EU membership, particularly in terms of economic support. This duality in rhetoric reflects the challenges these parties face in balancing nationalist sentiments with the practical realities of EU integration.

The use of negative sentiment in populist discourse, while a common feature, may have varying impacts across different national contexts. In some cases, it may resonate with existing public frustrations, while in others, it might be perceived as overly divisive. The lack of significant difference in sentiment between centrist and radical populist parties suggests that the effectiveness of negative rhetoric may depend more on the specific issues addressed and the national context rather than the degree of ideological extremism. The tailoring of populist themes to national contexts demonstrates the adaptability of populist rhetoric. This localization of populist messages allows parties to tap into specific historical narratives and cultural sensitivities, potentially increasing their appeal. However, it also highlights the challenge of developing a unified understanding or response to populism across the CEE region.

8 Conclusion

In conclusion, this study reveals that while there are common themes in populist rhetoric across CEE, the specific manifestations vary significantly based on national contexts. The use of negative sentiment and divisive language appears to be a consistent feature, but its effectiveness in gaining electoral support differs across countries. Understanding these nuances is crucial for developing effective strategies to address the challenges posed by populist rhetoric to democratic institutions in the region. The findings underscore the need for a multifaceted approach to addressing the rise of populism in CEE. This approach should combine efforts to strengthen democratic institutions, address economic disparities, enhance media literacy, and foster cross-border cooperation. By addressing the underlying factors that make populist rhetoric appealing, while also equipping citizens with the tools to critically evaluate political messages, it may be possible to mitigate the potentially destabilizing effects of populism on democratic systems in the region.

Future research in this area could benefit from longitudinal studies that track changes in populist rhetoric over time, as well as comparative analyses that explore the differences between successful and unsuccessful populist movements across different national contexts. Additionally, investigating the impact of social media and digital communication platforms on the spread and effectiveness of populist messages could provide valuable insights into the evolving nature of political discourse in the digital age.

Ultimately, the challenge of populism in CEE requires a nuanced understanding of the complex interplay between historical legacies, economic realities, cultural factors, and political institutions. By continuing to explore these dynamics through rigorous analysis of political discourse, researchers and policymakers can work towards developing more effective strategies for maintaining robust and inclusive democratic systems in the face of populist challenges.

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Appendix A – Exploratory Data Analysis

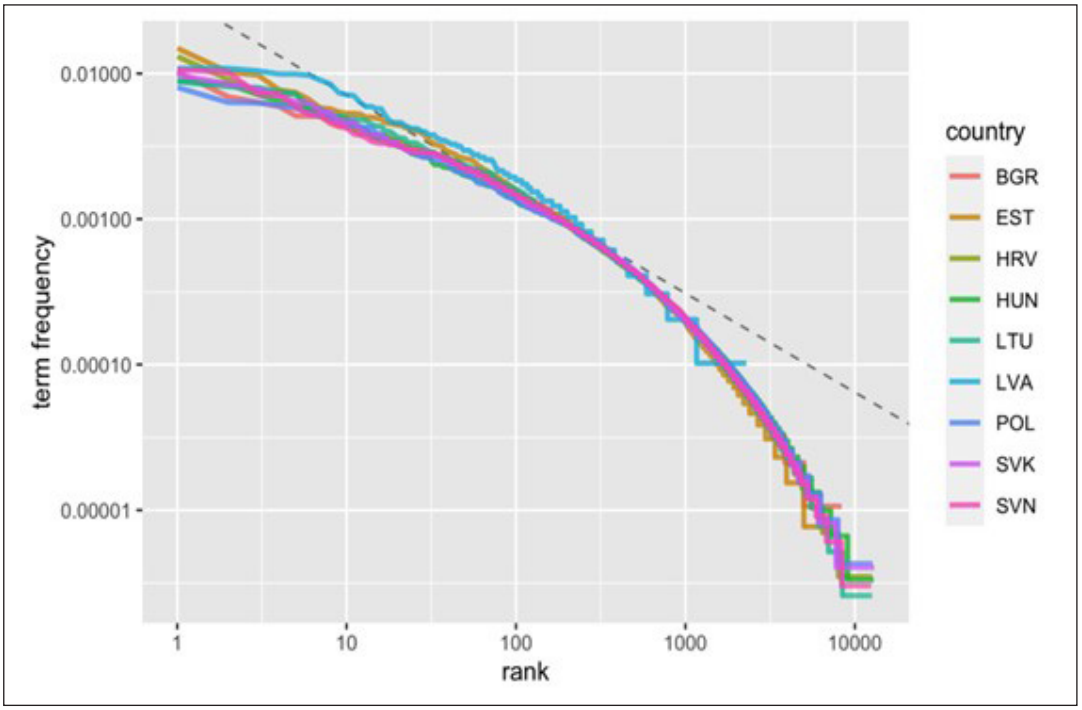

Figure 6 Use of unique words (rank) per term frequency divided by country

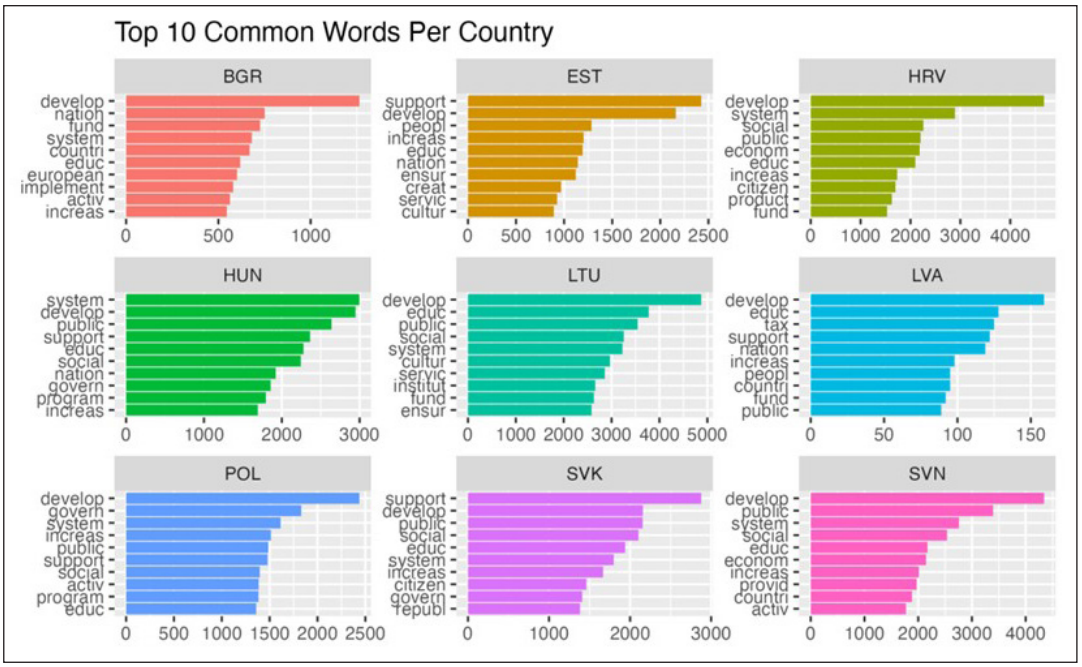

Figure 7 Most common words per country, raw frequencies.

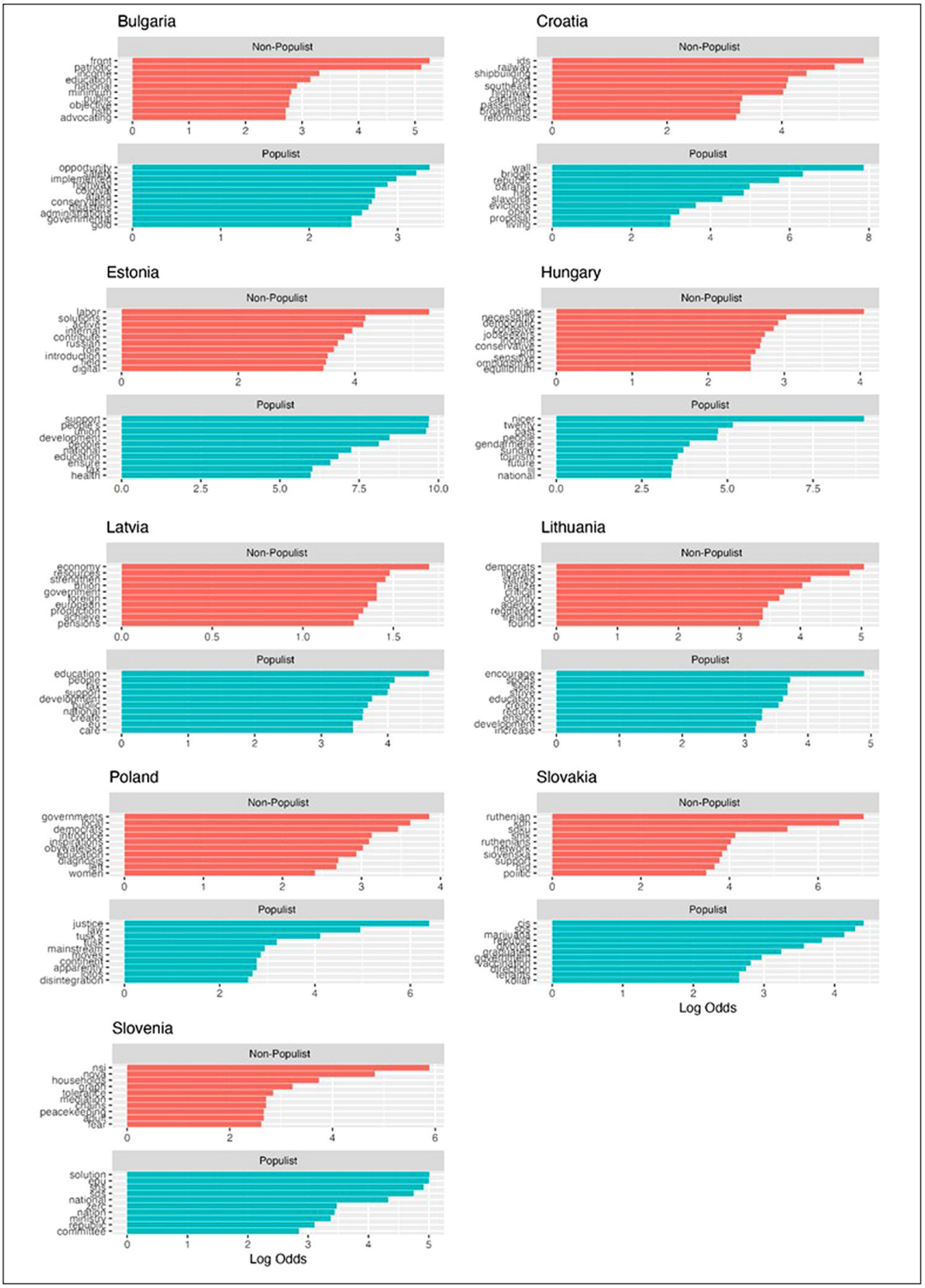

Figure 8 Log Odds of using certain groups, for all CEE cuntries, populist vs. non-populist parties

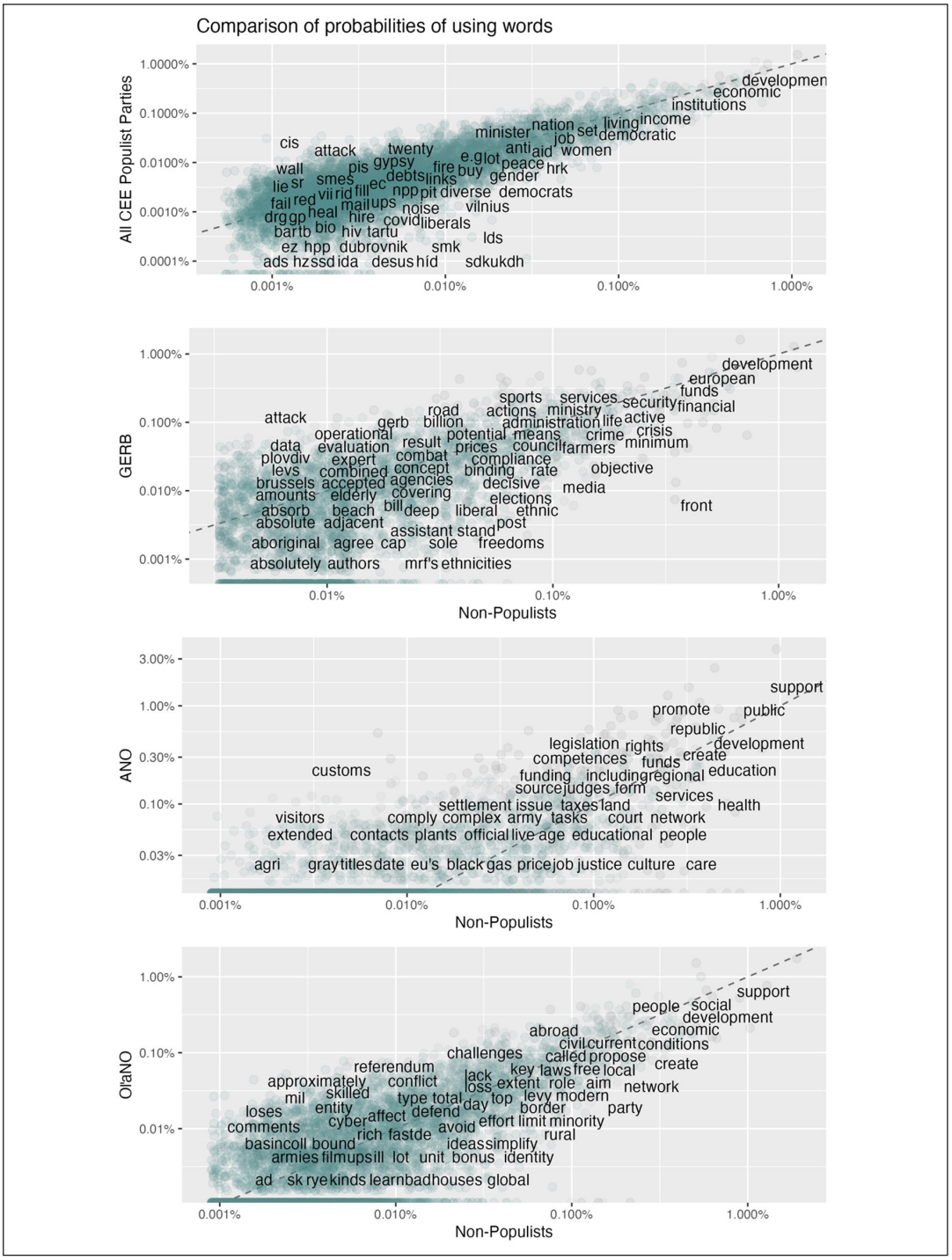

Figure 9 Comparison of probabilities of using certain words for all and selected parties characterised by populist rhetoric in all CEE countries and for selected centrist populist parties

Appendix B – Results

Table 5 Top 10 most negative manifestos by sentiment

Country	Party Name	Year	Rhetoric Type	Sentiment	Original Title
BGR	ATAKA	2013	Populist	−239	Planat Siderov sreshtu kolonialnoto robstvo. Upravlenska programa na partiya Ataka 2013
BGR	ATAKA	2009	Populist	−43	Програма на партия АТАКА за парламентарни избори 2009
HRV	RF	2020	Non-Populist	−39	Neposredne, kratkoročne i prijelazne mjere
BGR	ATAKA	2014	Populist	−39	Планът „Сидеров“. Нов път за България. Резюме на програмата на партия Атака
HRV	HSP	2000	Populist	−27	Tribine “Pitajte i birajte” Odgovori na pitanja političkim strankama
SVN	ZL	2014	Non-Populist	−18	Pot v demokratični ekološki socializem
HUN	LMP	2010	Non-Populist	−17	A fenntartható jövő, a befogadó társadalom és a megújuló demokrácia stratégiája
POL	LPR	2001	Populist	−8	Polsce – niepodległość. polakom – praca, chleb, mieszkania
LVA	SC	2011	Non-Populist	−5	Politisko partiju apvienība “Saskaņas Centrs”. Priekšvēlēšanu programma

Table 6 Sentiment by group of countries, divided by country

Country/Party	Populis Rhetoric	Mean Sentiment	Mean Negative Sentiment	Mean Positive Sentiment
Bulgaria	Non-populist	39.625	54.375	94
Bulgaria	Populist	217.333333	316	533.333333
Estonia	Non-populist	369.285714	142.333333	511.619048
Estonia	Populist	105.5	34	139.5
Croatia	Non-populist	217.289474	189.868421	407.157895
Croatia	Populist	103.375	164.25	267.625
Hungary	Non-populist	262.210526	493.473684	755.684211

Table 6 *(continued)*

Country/Party	Populis Rhetoric	Mean Sentiment	Mean Negative Sentiment	Mean Positive Sentiment
Hungary	Populist	180.571429	739	919.571429
Lithuania	Non-populist	353.03125	396.0625	749.09375
Lithuania	Populist	215.777778	146	361.777778
Latvia	Non-populist	18.875	8	26.875
Latvia	Populist	22.5	5	27.5
Poland	Non-populist	160.090909	182.545455	342.636364
Poland	Populist	310.333333	870.333333	1180.66667
Slovakia	Non-populist	329.416667	208.5	537.916667
Slovakia	Populist	191.5625	342.625	534.1875
Slovenia	Non-populist	329.851852	285.851852	615.703704
Slovenia	Populist	269.125	290.75	559.875

Table 7 Average sentiment for representative centrist and radical populist parties

Party Name	Mean Sentiment	Mean Negative Sentiment	Mean Positive Sentiment
ANO	159	78	237
Fidesz	153.5	435	588.5
GERB	525.5	396.75	922.25
OL'aNO	176	885	1061
PiS	466.5	1293.75	1760.25
SDS	372.8	394.8	767.6

Table 8 Most common topic for parties using populist vs. non-populist rhetoric in CEE

Country	Rhetoric Type	Most Common Topic
Bulgaria	Populist	colonial, ivan, representing, dimitar, sold, kostov, angelov, masters, dr, gypsy, taxed, treasury, minister, austrian, roads, prime, robbed, represents, army
Bulgaria	Non-Populist	objective, modern, security, management, guarantee, equipment, effective, business, formation, efficiency, transport, financing, media, package, crimes, market, activities, regional, interior, democratic
Croatia	Populist	baranja, slavonia, sports, region, regional, processing, decentralization, osijek, democratic, buildings, regions, space, developmental, legalization, pension, advocating, spatial, function, president, regionalization
Croatia	Non-Populist	freedom, creative, teaching, industries, left, gender, civic, human, reform, civil, green, freedoms, administration, public, judges, liberal, abilities, poverty, actors, solidarity
Estonia	Populist	population, business, financial, creates, environment, family, reducing, world, center, common, organization, primary, war, considers, activity, bring, change, democracy, dignity, jobs
Estonia	Non-Populist	party, reform, objective, develops, considers, creates, supports, party's, sets, steps, language, continues, participation, nordic, organizational, information, increases, learning, promotes, web
Hungary	Populist	soros, immigrants, sunday, june, immigration, christian, campaign, europeans, votes, winter, candidates, danger, migrants, fence, george, soros's, györgy, twelve, topics, talking
Hungary	Non-Populist	dialogue, introduce, eliminate, confirm, online, orbàn, launch, targeted, job, Fidesz, hours, months, thousands, prosecutor's, seats, sports, tens, reinforce, nursery, Fidesz's
Latvia	Populist	Not Available
Latvia	Non-Populist	choose, choose, business, knowledge, social, level, technology, eu, effective, government, nation, unity, minimum, diversity, educational, expenses, healthy, integration, competition, strategy, business, knowledge, social, level, technology, eu, effective, government, nation, unity, minimum, diversity, educational, expenses, healthy, integration, competition, strategy
Lithuania	Populist	manufacturers, adequate, sports, products, provide, competitiveness, diseases, organizations, highly, vocational, exports, diagnosis, qualification, physical, initiatives, waste, water, specialists, optimize, develop
Lithuania	Non-Populist	agricultural, housing, land, internet, computer, laws, crime, youth, farmers, privatization, credit, million, structures, kss, banks, insurance, transit, rural, customs, minimum

Table 8 *(continued)*

Country	Rhetoric Type	Most Common Topic
Poland	Populist	tusk, land, dealing, civic, resources, fi, team, functions, debate, tusk's, prosecutor's, minister, opposition, assessment, external, existence, psl, prime, function, mechanism
Poland	Non-Populist	minority, german, region, voivodeship, silesian, language, silesia, germans, parliament, minorities, representatives, germany, identity, region's, ethnic, strive, foundation, values, experiences, traditions
Slovakia	Populist	cis, nation, cultural, national, culture, slavic, language, minorities, healthy, nations, kr, sovereign, christian, respect, election, supports, ethnic, adopt, concept
Slovakia	Non-Populist	smk, party, hzds, minorities, environmental, living, parliamentary, field, people's, growth, accordance, cultures, production, economy, considers, regional, national, goals
Slovenia	Populist	party, committed, symbols, religious, agree, indigenousness, favour, liberation, respect, endangered, heritage, nation's, arms, coat, require, congress, struggle, sns, lay
Slovenia	Non-Populist	strengthen, solidarity, smart, strategic, balance, research, participation, active, strengthening, elderly, logistics, priority, creative, challenges, models, innovation, housing, knowledge, opportunities

Table 9 Most common topic for representative centrist and radical populist parties in CEE using populist vs. non-populists rhetoric

Party	Most Common Topic
Fidesz	christian, immigration, campaign, soros, immigrants, sunday, votes, candidates, danger, europeans, winter, june, challenge, debate, migrants, talking, topics, twelve, beauty, censorship
SDS	democratic, democrats, party, democracy, freedom, society, identity, equal, solidarity, civilization, diversity, dimension, values, preservation, welfare, supports, nature, consensus, favor, free
PiS	tusk, civic, sport, land, dealing, functions, liquidation, team, debate, fi, tusk's, banks, existence, bank, resources, power, assessment, opposition, psl, external
GERB	actions, implement, priority, integration, effective, corruption, optimization, results, society, improvement, accordance, capacity, status, improving, creating, crisis, european, sports, actions, implement, priority, integration, effective, optimization, results, society, improvement, accordance, capacity, status, improving, creating, crisis, european, sports
OL'aNO	public, education, system, social, support, children, people, increase, economic, environment, business, republic, corruption, law, development, cultural, protection, management, care, employment
ANO	turkey, border, terrorism, burden, migration, mechanism, visa, tourist, russia, region, vehicles, cooperation, committed, specific, asylum, eu, schengen, road, air, sports

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How opposition parties politicize democracy during autocratization

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https://intersections.tk.hu

Abstract

How do democratic actors rhetorically politicize their own disempowerment? Autocratization as a gradual process not only erodes democracy, but also progressively reduces the power of domestic actors to oppose this erosion. Often, incumbent governments disable the institutions meant to hold them accountable, such as parliaments. Drawing on the case of Hungary, we study how (opposition) parties rhetorically politicize democracy within the institution of parliament. As a case of rapid autocratization, Hungary saw far-reaching changes, including the transformation or abolition of many democratic institutions over the past years. New laws also restricted the rights of parliament itself, thereby narrowing the opportunities for public debate around democratic procedures. We address two questions related to this: To which extent do opposition parties politicize democracy and its procedures in a context of autocratization? And how does the way they talk about democracy differ from that of the government? The paper uses text-as-data methods – namely a dictionary of democratic principles and a word-embedding-based analysis of democracy rhetoric – to study parliamentary debates between 2010 and 2022. We find that democracy is highly salient for both the government and the opposition, however, their understanding of democracy differs in substance.

Keywords: democracy; autocratization; parliament; opposition

1 Introduction

How do democratic actors oppose their own disempowerment? Autocratization as a gradual process not only disables democracy, but also progressively reduces the ability of domestic actors to oppose this erosion. That is, if we consider autocratization a political game for power, incumbent governments are rewriting the rules of the game while playing it. In a typical democratic game, opposition parties are a key player competing for power, holding unique legitimacy and many institutional tools in criticizing the government as elected representatives. However, the competition between the government and the opposition becomes increasingly rigged. We can imagine democratic institutions designed to ensure

horizontal and vertical accountability as game pieces that the government selectively weakens or removes, limiting the opposition's ability to counter moves or resist government actions. Opposition actors – who once possessed various opportunities to influence the game and compete for power by questioning the government, holding it accountable or proposing alternative policies – now find themselves with limited options, wondering whether the game still provides them enough opportunities for an unlikely victory or is already too rigged to continue playing.

So far, we know fairly little about the actions and strategies of opposition actors in (democratic) countries that experience autocratization. Most research on autocratization is focused on incumbent governments, neglecting domestic resistance against autocratization (Gamboa, 2022, p. 3), an omission that has recently come under growing scrutiny: Scholars have pointed out that the success and failure of autocratization attempts depend to a large extent on repeated interactions between government and opposition actors (Cleary & Öztürk, 2022). Moreover, Tomini et al. (2023) highlight that there is potentially a diversity of opposition actors, resistance strategies, as well as motivations that are important to analyze for a more thorough understanding of autocratization and its opponents. Thus, not all opposition is necessarily democratic in nature or primarily aimed at re-democratization.

Adding to this emerging strand of research, this manuscript focuses on the parliamentary opposition, specifically on the language used in parliamentary speeches by opposition parties when talking about democracy. At first sight, parliamentary speeches are a key arena for opposition parties to challenge autocratization as parliamentary debates offer an opportunity for the opposition to articulate criticism of undemocratic legislative proposals in a direct and public confrontation with the government. Such scrutiny activity is a key part of parliamentary opposition behavior in democracies (Ilonszki & Giorgi, 2018). However, parliamentary opposition does not come without costs as it may also be seen as giving a democratic veneer to an increasingly authoritarian regime. As modern ideas of democracy 'regard the existence of an opposition party as very nearly the most distinctive characteristic of democracy itself' (Dahl, 1966, p. xviii; also Biezen & Wallace, 2013), non-democratic systems 'strongly rely on the legitimacy that the facade of a quasi-functioning opposition provides them.' (Susánszky et al., 2020, p. 764). This poses a dilemma to opposition parties in deciding whether to withdraw from institutions or if and how to use the parliamentary stage as a highly visible place for opposition activities.

Whether and how opposition parties talk about democracy and democratic principles in this venue is a logical extension of this dilemma: On the one hand, emphasizing democracy may be a way to signal opposition to autocratization and scandalize changes. If the rules of the game are already up for debate, protesting their change highlights the riggedness of the game. On the other hand, opposing autocratization by democratic means may be ineffective for opposition parties if governments simply refuse to engage or to compromise. Then, criticizing the government in terms of democracy may render democracy itself an issue of partisan conflict and make the concept contentious for voters as well. Criticism of undemocratic policies can then be portrayed as merely a part of partisan politics.

This paper studies this broader dilemma in the case of Hungary. As one of the most drastic cases of autocratization in the European Union and worldwide (Boese et al., 2022)

but also as a country that had fairly well-established democratic institutions at the onset of autocratization, Hungary is a highly relevant case for assessing the opportunities and challenges for opposition parties in criticizing autocratization from within democratic institutions. Nevertheless, research on Hungary is limited: As a recent analysis of the Hungarian opposition's strategic dilemmas put it: 'there is hardly any systematic analysis grasping the impotence of opposition parties and their role in the new "illiberal" political system of Hungary.' (Susánszky et al., 2020, p. 762). Focusing on mentions of democratic principles and democracy rhetoric, this paper aims to contribute to addressing this gap with a largely exploratory analysis of opposition rhetoric.

The Hungarian case also highlights some of the key challenges to democratic actors: It is not only the opposition but also Fidesz that uses democracy rhetoric with prime minister Viktor Orbán famously introducing the terminology of 'illiberal democracy' for the country. That is, opposition parties have to distinguish their concept of democracy from that of Fidesz and struggles may well be over who gets to claim to be on the side of democracy, a label that commands support by a large share of citizens. Thus, rhetorical struggles about democracy also imply struggles about democracy's meaning and who gets to define it.

The paper proceeds by first outlining the theoretical background of a politicization of democracy. While it is difficult to study such long-term shifts in political debates, the present paper uses a text-as-data approach to summarize changes based on a large body of text. That is, this study builds on a corpus of plenary speeches, held in the Hungarian parliament between 2010 – when Fidesz entered into government – and 2022, at times looking at the pre-2010 period for comparison. It combines two different text-as-data methods to capture changes in the debate about democracy: First, it draws on a dictionary to study the salience of several democratic principles (rule of law, public sphere, individual liberties, separation of power, participation, free and fair election), as well as the word itself (democracy) and two key institutional structures of liberal democracy (courts and the constitution). Second, it studies democracy rhetoric, that is, the use of the label democracy, using word embedding techniques and presenting differences in and changes to the nearest neighbors of democracy for the government as well as the opposition. The results show that democracy is highly politicized in parliamentary discourse and this politicization increased with the Fidesz government. However, it also shows commonalities in parties' democracy rhetoric. The paper concludes by discussing the implications of these findings for the study of autocratization and democratic opposition.

2 Politicizing democratic procedures

Beyond the study of extreme parties (e.g., Sartori, 1976, pp. 117–118), where anti-democratic stances were always at the center of analysis, political scientists have only recently started to consider parties' stances toward democratic systems to be an important topic. However, instances of (attempted) autocratization in democratic countries have increased attention to the potential of elite rhetoric to undermine support for democratic norms (see e.g., Clayton et al., 2021; Kingzette et al., 2021). Parties' rhetoric can affect public opinion by cueing voters, especially strong partisans, to ignore or even endorse violations of democratic principles for policy gains. Thus, how parties speak about democracy and its institutions matters.

The present paper discusses this 'speaking about democracy' through the lens of a politicization of democracy and its procedures: Politicization refers to the expansion of (the scope of) conflict surrounding an issue (Kriesi et al., 2012; following Schattschneider, 1975), as well as the shaping of a topic into a political issue by transporting it into the field of political decision-making (De Wilde & Zürn, 2012). In this sense, a politicization of democracy may happen through increased emphasis on democracy, i.e., by a growing salience of the topic. Beyond salience, it may also happen when parties compete over the topic: As an issue moves from consensual to contentious, its scope of conflict grows. Thus, politicization of an issue can take different forms, being driven by salience or divergent positions. Below, we shall first discuss the relevance of the phenomenon before discussing existing literature on the politicization of democracy, the approach taken in this manuscript, and the Hungarian case which we study empirically.

2.1 Why politicization of democracy matters in contexts of autocratization

Traditionally, the literature on issue politicization has focused on contentious and politically divisive issues such as European integration (Green-Pedersen, 2012; Hoeglinger, 2016; Hooghe & Marks, 2009; Hutter et al., 2016) or immigration (Gessler & Hunger, 2022; Green-Pedersen & Otjes, 2017; Hutter & Kriesi, 2022). In these cases, literature posits that a 'permissive consensus' (Hooghe & Marks, 2009) was disturbed by a politicization of the issue under study. Hence, literature on politicization sometimes implicitly portrays politicization as a disruption that makes compromise difficult amd may have negative consequences.

Similarly, a politicization of democracy in the sense of a challenge to established democratic norms may be seen as something negative in liberal democracies (which are the main focus in existing work on the topic such as Engler et al., 2022). However, in contexts of autocratization, a politicization of democracy may also be a sign of resistance to this autocratization: Clearly, democratic norms should be debated and become the focus of political conflicts when a government infringes on them. Hence, the present paper asks: To which extent do opposition parties politicize democracy and its procedures in contexts of autocratization? And how does the way they talk about democracy differ from the way the government talks about it?

While these questions are largely exploratory, we hold that they are important to investigate for three primary reasons: First, democracy or its absence has become an important lens through which researchers and the public view Hungary. Scholars have used terms such as 'electoral autocracy' (Hellmeier et al., 2021) and 'defective democracy' (Bogaards, 2018) to describe the state of democracy in the country, Hungarian prime Viktor Orbán himself famously declared the country an 'illiberal democracy' and later an 'illiberal state.' Democracy has also become a key focus of contention between the EU and its Eastern member states and Hungary in particular (Lorenz & Anders, 2021; Priebus & Anders, 2020). With the European Parliament designating Hungary a 'hybrid regime of electoral autocracy' (European Parliament, 2022) citing 'an increasing consensus among experts that Hungary is no longer a democracy' (European Parliament, 2022), democracy is also a prominent point of contention. How this lens on the country is reflected in domestic parliamentary debates is relevant in itself, as well as for the resonance of these

discourses among the Hungarian public. While there has been analysis of responses to democratic backsliding in the European parliament (Meijers & van der Veer, 2019), there is to this date no similar analysis for Hungary's own parliament.

Second, politicization may also influence whether citizens consider democracy in their electoral decisions: Research on issue ownership suggests that voters evaluate parties 'with respect to the issues that are included in the election agenda' (Holler & Skott, 2005, p. 216). That is, voters make choices depending on issue salience, rather than only on their general similarity to a party. This means voters may be more likely to consider a party's democratic credentials in their electoral choice when the topic is salient. Recent studies examining the connection of democracy attitudes and affective polarization also discuss whether elite-signals regarding the democratic credentials of other parties may play a role in how voters evaluate these parties in contexts of democratic backsliding (Gessler & Wunsch, forthcoming). In this situation, parties' stances toward democratic systems may become an electorally relevant issue. This also relates to democratic principles: Principles such as the rule of law matter for the integrity of democracy but are less salient for ordinary citizens. Here, a politicization may make voters aware of infringements by incumbent governments.

Third, a politicization of democracy may also have an impact on citizens' support for democracy and specific policies. A simple version of this argument holds that the propaganda of authoritarian regimes may redefine democracy, leaving citizens with a distorted notion of the concept (Kirsch & Welzel, 2019, p. 62). However, effects may also be more nuanced: Kingzette et al. (2021), Gidengil et al. (2021), and Clayton et al. (2021) argue that elite rhetoric which signals displeasure with democratic norms or doubts the integrity of institutions can erode support for or trust in democratic norms among affectively polarized partisans. However, Kingzette et al. (2021) also find increased support for democracy among opposition partisans: Such a partisan type of cue-taking means public support for democratic norms by opposition parties could actually increase support for democracy among their supporters. Relatedly, discussing party rhetoric on election reform and electoral fraud, McCarthy (2023) finds that the use of democratic principles can help political elites to justify particular policies regarding the democratic system and the use of even unrelated principles significantly increases support for these changes. Hence, incumbents' use of democratic principles may also serve to immunize undemocratic policies they pursue. In sum, how parties speak about democracy may shape public opinion, both in positive and negative ways.

2.2 Conceptualizing politicization of democracy: Selective emphasis and democracy rhetoric

Empirically, our knowledge of how parties politicize democracy is limited. Two recent studies of mainstream parties have analyzed parties' positions on democratic performance (that is, how they evaluate the existing democratic system), as well as their general emphasis on democratic principles: Rohrschneider & Whitefield (2019) study how parties evaluate democratic performance. Their core emphasis is on strategic incentives, specifically the argument that regime access conditions parties' evaluations of democratic

performance. This makes parties with limited governing prospects and limited organizational capacity, as well as those not habituated into government, more likely to be critical of the democratic performance of a regime. Additionally, they also provide evidence that democratic quality matters for parties' evaluations of democracy. Thus, the political context is a key determinant of the politicization of democracy in their study.

A second study shows that ideological aspects may also play a role in the politicization of democracy: Engler et al. (2022) combine ideological and strategic factors in their analysis. They argue that in striving for a unique position in the political space, parties can either distinguish themselves by positional differentiation or by challenging the performance of the democratic process. That is, emphasizing democracy is a tool to carve out a unique position within the party system that relies on an alternative mechanism of differentiation than positional change. They argue that not just anti-system parties but all challenger parties have a 'strategic incentive' to politicize principles of (liberal) democracies. However, parties' ideology determines which aspects of democracy parties challenge and thus shapes their appeal.

What unites both approaches compared to other studies of issue politicization is that they explicitly or implicitly adjust their measurement to democracy's status as a 'valence issue' (Stokes, 1963): Given the overwhelming support for democracy among citizens (Ferrín & Kriesi, 2016), parties are unlikely to openly oppose democracy. Hence, Rohrschneider & Whitefield (2019) look at evaluations of democratic performance rather than democracy, whereas Engler et al. (2022) distinguish alternative principles of democracy that parties highlight. In both cases, rather than espousing different positions, the studies look at how parties try to prove their competence and shift the meaning of democracy to aspects where the public views them as competent.

The contribution of this manuscript is twofold: On the one hand, we repeat the analysis of the salience of democratic principles as studied by Engler et al. (2022) in a context where democracy is under attack. This provides important comparative evidence on the salience of an issue that is rarely studied. On the other hand, we introduce democracy rhetoric as an additional aspect of the politicization of democracy. Specifically, we argue that parties often strategically use the term democracy in ways that exclude or discredit their political opponent and that portray their own actions as democratic. Thus, the politicization of democracy also includes rhetorical competition over what democracy means.

In using 'democracy rhetoric,' parties can build on the diversity of meanings that democracy has both among researchers and in the public (see for a collection of over 3000 'democracies with adjectives': Gagnon, 2020). There is significant variation in what citizens understand as democracy and 'the immediate political context substantially determines what a person perceives as democratic' (Ulbricht, 2018, p. 1390). In the Hungarian context, Susánszky et al. (2021) have examined Hungarians' associations with democracy, who highlight equality, the people, political liberties, freedom and only in fifth place democratic institutions including elections (see also Messing et al., 2014).[1] This ambiguity in the meaning of democracy means different things might plausibly pass as democratic for citizens.

[1] See also König et al. (2022) for a comparative methodological discussion of studies measuring citizens' conceptualization of democracy.

Relatedly, the above-mentioned dynamic of partisan motivated reasoning may also lead citizens to view certain things as democratic if party elites portray them as such: Simonovits et al. (2022) highlight 'partisan hypocrisy' in support for norm-eroding policies. Krishnarajan (2023) explains this phenomenon by arguing that voters are willing 'rationalize' undemocratic behavior as democratic if their policy preferences are at stake. He finds that citizens in Hungary are among those most likely to rationalize undemocratic behavior. Thus, citizens are often willing to take democracy rhetoric at face value if they agree with its goal.

Given the normative implications of calling something (un)democratic, democracy rhetoric can be part of a process of extreme political polarization that McCoy & Somer (2019) call 'pernicious polarization': parties pursue their objectives with polarizing strategies, including the demonization of their opponents. This idea can be found in similar terms in the distinction between tolerant and intolerant modes of engagement in the literature on responding to populist parties (Bourne, 2022). Using these categories, criticizing political opponents as anti-democratic can be categorized as an intolerant mode of engagement that delegitimizes the opponent. For Hungary specifically, Körösényi (2013, p. 16) has argued that questioning the national respectively democratic commitment of the other political camp has been a part of delegitimizing and polarizing strategies since the 1990s. Where the politicization of democracy becomes part of a polarization spiral, it may increase challenges to democracy: Cleary & Öztürk (2022) suggest that more moderate opposition responses to autocratization allow the opposition to compete in and win the next election, whereas irregular opposition responses may contribute to democratic breakdown.

2.3 The case: The disempowerment of the Hungarian parliament

Of course, in the face of ongoing autocratization, the Hungarian parliament has itself not remained isolated from this process. Ilonszki & Vajda (2021, p. 771) diagnose an 'unprecedented disempowerment of the Hungarian parliament, regarding parliament's legislative and scrutiny functions.' Similarly, Várnagy & Ilonszki (2018) speak of a 'de(con)struction of parliamentary opposition. In this regard, we can distinguish several aspects: the legitimacy of the parliament, its procedural rights and the consequences for parliamentary debates.

First of all, Fidesz as a party and actors associated with it have diminished the legitimacy of parliament already before entering government in 2010. Most importantly, Fidesz supported protest actions staged in front of the parliament. This use of extra-parliamentary opposition tactics (see Várnagy & Ilonszki, 2018, p. 151) challenged the norms for opposition behavior that had become established after the transition. This was connected to the generally extreme pattern of political polarization where parties of both sides questioned the legitimacy of their competitors (Enyedi, 2016; Körösényi, 2013; Vegetti, 2019).

Regarding the procedural rights of parliament, after coming to power, Fidesz also proceeded to restrict the power of the parliament through legislation. Such changes include the formal powers of the parliament, increased thresholds for opposition activities in parliament, as well as new disciplinary powers of the speaker (Ilonszki & Vajda, 2021). For example, several key laws related to civil liberties (e.g., law on freedom of assembly, freedom of association, popular initiatives, legislative procedures) were exempted from the requirement of a two-thirds majority (Várnagy & Ilonszki, 2018, p. 156).

This has significant consequences for parliamentary debate: Generally, several analysts have pointed to the increasing speed of legislation, as well as the growing number of modifications made to new laws (Sebők et al., 2022; 2023; Várnagy & Ilonszki, 2018). The speed is often summarized in the word 'törvénygyár' ('legislation factory'). While the focus of many studies is on the declining legislative quality on several dimensions (which has been called 'legislative backsliding': Sebők et al., 2023), the growth in speed and volume has important implications for the ability of the opposition to contest these laws. For the current analysis, this means parliamentary debates on some of the key measures during this period was fairly short and important details may be hidden in numerous amendments. As an example, only few days were dedicated to discussing the new constitution in 2011 (Ilonszki & Vajda, 2021, p. 774).

Clearly, these processes diminish the possibility of opposition parties to politicize processes of autocratization with reference to democratic principles: The restrictions to their procedural rights, as well as the limited time allotted for parliamentary debate, make it difficult to contest autocratization and use parliament as a forum for debate. Given the decline in procedural rights and agenda-setting power, participation in parliament also becomes less attractive for opposition parties: without the potential for meaningful change, parliamentary activity may merely bolster the legitimacy of the government. Opposition parties face a fundamental dilemma: 'by taking part in the elections and taking the few seats they manage to secure in Parliament, they end up providing legitimacy to the regime they harshly criticize' (Susánszky et al., 2020, p. 765).

3 A text-as-data approach to opposition rhetoric in parliament

Since the politicization of democracy occurs through public discourse, parliamentary speeches and the language used in them are an ideal venue to study politicization. For this, we draw on natural language processing methods: There has been a recent growth in text-as-data studies in the social sciences (Grimmer et al., 2022), including in so-called 'low-resource' languages that receive less attention in the development of natural language processing techniques (cf. for a brief overview of work on Central-Eastern Europe: Németh & Koltai, 2023, p. 7). This includes a significant body of work on parliamentary text, e.g., Üveges & Ring (2023) on emotionality and Sebők et al., (2017) on the geographical and policy content of interpellations. Related work that uses text-as-data methods as well as handcoding is the Hungarian Comparative Agendas Project (Boda & Sebők, 2019; Sebők & Boda, 2021) which annotates the transcripts of the National Assembly, as well as other types of political documents, with policy categories. Most notable here is the work by Sebők & Boda (2021) on policy agendas across regime types. The present study builds on this work but focuses on the politicization of democracy through language, rather than policy content.

The analysis relies on parliamentary transcripts, which allow us to study the textual content of parliamentary speeches. We draw on the ParlText dataset (Sebők et al., 2024) which contains 487,877 speeches held in the Hungarian National Assembly between 1994 and 2022. We exclude all speeches by presidents of parliament (N=261,269) since these are often procedural. All other speeches (N=224,325) are used to estimate a word embedding

model (see below). For the detailed analysis, we restrict the sample in scope and time: Regarding time, most of the analysis focuses on the post-2010 period since Fidesz re-gained power. This includes three legislative periods (2010–2014, 2014–2018, 2018–2022). Regarding scope, we discuss the detailed selection and aggregation of parties in the next section but exclude speeches by independent MPs[2] and national minority representatives. This means that we focus on 47,455 speeches by the opposition and 40,607 speeches by Fidesz and the KDNP (which run with a joint list and govern together).

Figure A.1 in the Supplementary Material shows the distribution of all speeches by legislative period in the dataset for each party, offsetting those within the study period by color. We preprocess the texts by removing stopwords, punctuation, numbers, as well as words that occur less than 3 times in the dataset. We also replace party names that contain words related to democracy (e.g. the Christian Democratic People's Party and the Alliance of Free Democrats) as well as their derived forms to the respective abbreviations to avoid biasing estimates of references to democracy. More details on the period and average length of speeches are included in Table A.1 in the Supplementary Material.

3.1 Parties

Throughout the manuscript, we at times use a binary distinction between the government and what we consider the left-liberal opposition. This decision is partly a methodological one – some of the methods we apply are specifically built to compare two groups – but is also motivated by the polarization of the Hungarian party system which has consolidated into camps. To explain this, we shall briefly consider the relevant parties: Since the transition to democracy, Hungary has been characterized by a multi-party system that consolidated earlier than in other countries in the region (Enyedi, 2016). The system has also been marked by considerable programmatic stability (Borbáth, 2021). Nevertheless, numerous opposition parties have emerged and disappeared over the years, facing an electoral system that favors big parties and joint lists (Tóka, 2014) and a dominant government party (Enyedi, 2016). In the following, we shall briefly discuss the right and left side of the party spectrum to the extent that they were represented in parliament during the period of study.

The largest right-wing party in parliament is the governing Fidesz, which runs in an alliance with the Hungarian Christian Democratic People's Party (KDNP). Other conservative parties included the MDF (Hungarian Democratic Forum) which was in government in the first phase after the transition but has since successively lost relevance and missed re-entry into parliament in 2010. Similarly, the FKgP (the Independent Smallholders' Party) was historically important but lost parliamentary representation in 2002. MDNP (the Hungarian Democratic People's Party) was a short-lived conservative split from MDF that was important primarily before the period we study. Mostly, the consolidation of the right was the result of a strategy of unification pursued by Fidesz (Enyedi, 2005).

[2] We use party affiliation as listed on the official webpage of the parliament for the speech date. Exceptions are MPs from DK, Együtt, LMP and Párbeszéd which were listed as independent because of party splits or because of the size of their party. In these cases, party affiliations were manually added.

On the far-right,[3] MIÉP (Hungarian Justice and Life Party) had parliamentary representation between 1998 and 2002. It later joined forces with Jobbik (the Movement for a Better Hungary), which first entered into parliament in 2010, winning almost 17 per cent of the popular vote. While Jobbik was a right-wing competitor to Fidesz for the longest period, it joined an opposition alliance in 2022 in a bid to oust Fidesz and later lost much of its support to a new radical right competitor (Mi Hazánk / Our Home Movement). That is, while Jobbik can clearly be associated with the extreme right of the political spectrum at the beginning of the period (Pirro, 2018; Róna, 2016), its place becomes less clear later (Borbáth & Gessler, 2023). For this reason, we do not include Jobbik in the analysis whenever we use methods to draw binary contrasts but discuss it in the analysis of individual parties.

Competitors on the left traditionally included the Hungarian Socialist Party (MSZP), as well as the liberal Alliance of Free Democrats (SZDSZ). Both parties had formed a coalition in 2002, governing the country with changing prime ministers (including a SZDSZ-supported minority government after the 2006 political crisis) for eight years prior to the election of Fidesz. During this period, an economic crisis and mayor protests contributed to the decline of both parties (Gessler & Kyriazi, 2019; Várnagy & Ilonszki, 2018). At the end of their government, SZDSZ won only 0.25 per cent of votes in the 2010 election while MSZP suffered a historic loss of votes, winning only 19.3 per cent of the vote. Since then, MSZP has been in opposition.

Numerous other left and liberal parties emerged over the years: Already during the MSZP government, LMP (Politics Can Be Different) was founded as a green-liberal party. While the party was ideologically closer to other left-liberal parties than to the right-wing parties, the party describes itself as centrist and has maintained distance from MSZP and SZDSZ, as well as from other left-liberal parties that emerged later. The Democratic Coalition (DK) split from MSZP under the leadership of former MSZP prime minister Ferenc Gyurcsány in 2011. Együtt (Together) is a left-liberal coalition of civil organizations that was originally headed by Gordon Bajnai, another former prime minister who led a caretaker government between 2009 and 2010. Another party, Párbeszéd / PM (Dialogue for Hungary) split from LMP when there was an attempt to establish a joint left-liberal list for the 2014 election when LMP refused to support the united list. Ultimately, MSZP, Együtt, Párbeszéd, DK and the small Liberal Party MLP formed a joint electoral list in 2014, with only LMP running on its own. In 2018, LMP, Együtt and DK ran separately from the joint list of MSZP and Párbeszéd, with Együtt dissolving after it did not receive representation. 2022 saw a unity list with DK, Jobbik, LMP, MSZP, Párbeszéd and the new Momentum Mozgalom.

While these left and liberal parties are organizationally distinct, their ideological profile is overlapping (Gessler & Kyriazi, 2019), especially with regard to democracy, and many of them – for example Együtt – were fairly short-lived. Hence, in the interest of studying opposition to Fidesz rather than the rhetoric of specific parties, we group MSZP, Együtt, Párbeszéd, DK and LMP together as left-liberal opposition.

[3] We consider Fidesz as right-wing and MIÉP, Jobbik and Mi Hazánk as far right parties based on their origin, notwithstanding the overlaps between their policy programs that have been pointed out in previous research: Böcskei & Molnár (2019) and Kreko & Mayer (2015).

3.2 Analysis

We use the corpus of parliamentary speeches for several types of analysis: First, we measure the frequency of three-word clusters: democracy and two of its core institutions (courts, the constitution). For these, we do not compile comprehensive dictionaries but merely include the word stem (for democracy) respectively the Hungarian word(s) for the institution (courts, constitution).

Next, for measuring the salience of democratic principles, we follow Engler et al. (2022) and adapt their dictionary of democratic principles to the Hungarian context, making several modifications: Adapting the dictionary to the context, we slightly adapt the selected principles. Given the important role of liberal principles in the institutional defense to autocratization, we include the four liberal principles they study: The separation of powers, the rule of law, public sphere, as well as individual rights. We slightly adapt the participatory principles. Of their original principles (competition, participation, representation), we include only participation as competition and representation are fairly abstract and of limited salience in the original study. Instead, we add the principle of free elections: this principle overlaps with the principle of competition outlined by Engler but separating it allows us to explicitly measure a topic that we expect to be highly salient in our case. Instead of literally translating the dictionary, we try to include equivalent words for each category. As the original dictionary listed institutions specific to the countries under study, this necessarily comes with deviations. We include the Hungarian language dictionary in Table A.3, as well as an automated English translation in Table A.4. To allow readers to assess the validity of the dictionary, we also include the most frequent (Hungarian) terms picked up by the dictionary in Figures A.2 and A.3.

Finally, to study democracy rhetoric, we estimate a GloVe word embedding model on all speeches. Such word embedding models represent words as vectors in a high-dimensional space, where the distance between words is a proxy for their semantic similarity (Rodriguez & Spirling, 2022). For example, Szabó et al. (2021) use word embeddings to study the distance between words and their contextual shift over time in issues of the communist Pártélet journal in Hungary. We estimate the word embedding model on the full dataset (here including the period before Fidesz came to power to maximize the corpus, removing only the speeches of the president of parliament).[4] We follow the suggestions outlined in Rodriguez et al. (2024): We remove words occurring fewer than three times and use a window size of 6 with a vector size of 300. To show the face-validity of the embedding model, we include a list of nearest neighbors for some key terms in Table A.15 in the Supplementary Material which can be compared to the respective nearest neighbors of the pretrained model in Table A.16. These nearest neighbors are words with the most similar embedding to the word prompted. While the pretrained model recovers mostly variations of the same word in different cases, the local model has a smaller vocabulary but still recovers substantively meaningful nearest neighbors that are semantically highly related to the concepts.

[4] Given the corpus size is still not large for a word embedding model, an alternative specification using a pretrained model is discussed in the Supplementary Material.

To obtain the typical use of democracy for Fidesz and the opposition from the word embedding model, we estimate an à la carte (ALC) embedding (Rodriguez et al., 2023) for Fidesz and the joint left-liberal opposition. Such ALC embeddings combine a small number of example uses of a word (here: references to democracy) with the pretrained embedding to produce a context-specific embedding for the concept. This allows comparing the context of use for words, both for describing differences and quantifying them. Here, we use ALC embeddings to compare the context of use for democracy-related words between Fidesz and the left-liberal opposition. Specifically, we use the 10 nearest neighbors of the respective ALC embedding and compare the overlap between the sets of nearest neighbors for the two groups. We also calculate the similarity between the nearest neighbors and the group embedding. The ratio of these two similarities provides a measure of how discriminant each neighbor is for the respective group (Rodriguez et al., 2023).

As an alternative measurement that emphasizes contrast between groups rather than frequent concepts, we also replicate keyness plots used by Engler et al. (2022) for all democratic principles in the Supplementary Material and discuss the results for 'democracy' in the main text. That is, we analyze a window of six words[5] around uses of the wordstem 'demokr*' in the original corpus and calculate a -test to find significant differences between the frequency of context words among the governing parties and the left-liberal opposition.

4 Results

4.1 Word frequencies and the salience of democratic principles

In a first step, we shall look at the frequency of the word clusters and the salience of democratic principles for the different parties during the Fidesz government. Here, salience designates the share of speeches which mention the respective principle. Figure 1 shows the salience of different democratic principles, using the values for the government as a reference and indicating the difference by an arrow where it is greater than one percentage point on the original scale of emphasis (with orange signalling a higher emphasis by Fidesz/KDNP and turquoise signalling a higher opposition emphasis). We shall first look at the three word clusters: These are democracy, courts and the constitution. Notably, democracy tends to be more salient for the opposition with all parties emphasizing democracy more (with the exception of Jobbik) and emphasizing courts more (with the exception of the MSZP and Párbeszéd). The constitution is emphasized less than or roughly equally to the joint Fidesz/KDNP group. This may be a consequence of the 2011 constitution which was deprived of many of the provisions that opposition parties would have referenced to: Fidesz made it impossible for the opposition to insist on the rules of the game while changing them. While many of the differences in emphasis are marginal, the difference in the frequency of references to democracy is sizable for Párbeszéd, DK, Együtt and LMP, as well as in references to courts for DK, Együtt and Jobbik. For the constitution, there is no in-

[5] Engler et al. (2022) use a ten-word window which we have adapted for consistency with our word embedding.

creased emphasis by the opposition. All in all, at least rhetorically, the opposition parties seem to discuss democracy more and, to some extent, mention a key institution of democracy (namely courts) more frequently.

This picture of a higher emphasis receives mixed support when looking at the democratic principles: Here, several opposition parties emphasize the rule of law more than Fidesz/KDNP. The separation of power is not discussed to any large extent by any of the actors, similar to the public sphere (where, however, differences exist for DK and Párbeszéd that emphasize the topic more). Free elections are only mentioned more by DK and roughly equally by all other parties. Participation is generally more salient and differences in emphasis compared to Fidesz are notable for Együtt, Jobbik and LMP. Recapitulating party differences across word frequency and principles, it is clear that MSZP, Jobbik and LMP differ only marginally from Fidesz/KDNP, while it is mostly DK, Együtt and Párbeszéd that emphasize words or principles more than Fidesz/KDNP.

One should keep in mind that these parties differ with regard to the time they spent in parliament as only MSZP and LMP existed for the whole period since Fidesz/KDNP took office (see Table A.2 in the Supplementary Material). As the parliamentary agenda introduces boundaries on the salience of specific principles – for example with specific bills being tabled – parties only included for a shorter period may show biased and more extreme values: Együtt is a good example here with only 196 speeches included in the dataset. A closer look at the different legislative periods (see Figure A.4 and Table A.5 in the Supplementary Material) shows significant variation over time. For example, LMP sees a significant decline in emphasis both related to the word clusters and the democratic principles. For other parties, for example DK, the picture is more mixed across principles. The detailed visualization also shows that emphasis on the constitution is highest for all parties in the 2010–2014 electoral cycle which was the period in which Fidesz passed a new constitution (see Halmai, 2023). We shall return to this below, detailing the annual development.

Generally, it is notable that the salience of the three-word clusters, as well as the principles, is remarkably high. While Engler et al., (2022) analyze party press releases, the salience of no principle even reaches 1 per cent and the liberal principles mostly hover around 0.1 per cent. While this is not surprising given the crisis of democracy and ensuing autocratization in Hungary, it is still worth noting. Although we cannot distinguish whether this salience is a consequence of polarization, specific autocratization measures or other influences, it seems that autocratization and a rhetorical politicization of democracy do go hand in hand in this case. Nevertheless, the longitudinal picture (see again Figure A.4 and Table A.5 in the Supplementary Material) also shows that the salience was high even before Fidesz (re-)entered government.

Looking at the annual development, Figure 2 shows the use of the different categories over time for the left-liberal opposition (as an aggregated mean of the different parties) and the two governing parties, as well as the trend across the whole parliament (in black). Given the high salience established in the first analysis, we now also include the period before Fidesz took office again to allow a comparison with the extent this politicization was related to the Fidesz government or is a broader characteristic of the public debate in Hungary.

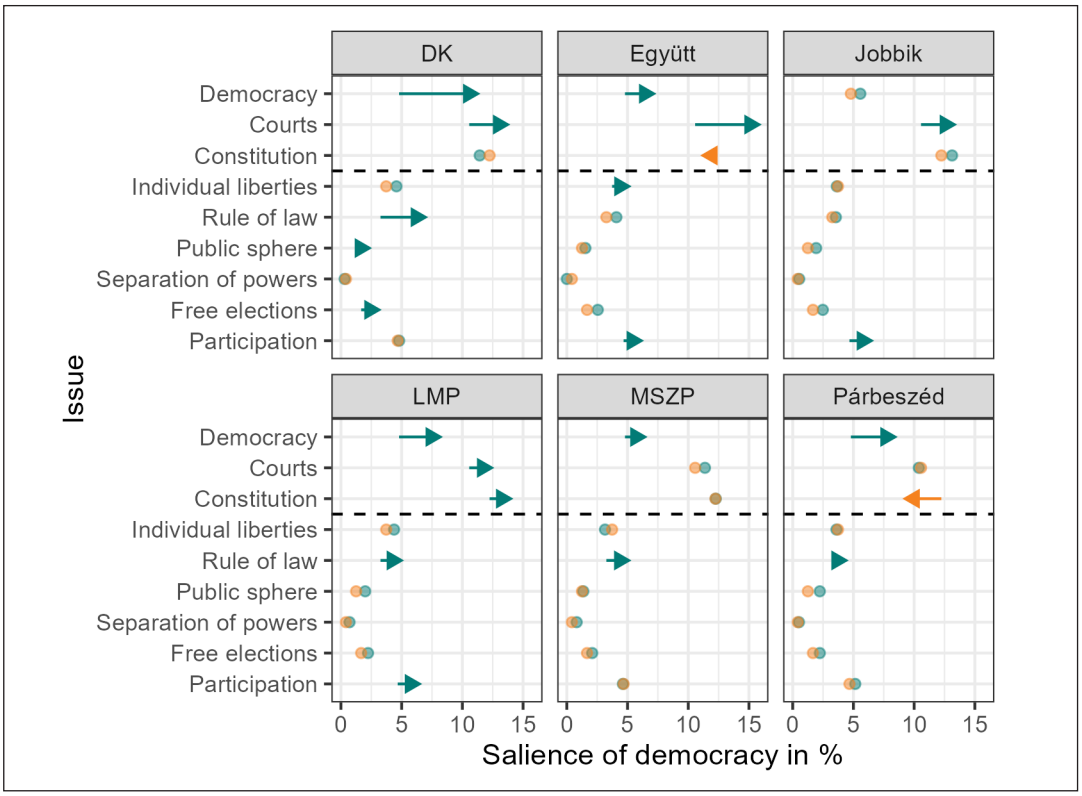

Figure 1 Average salience of democracy by party. Values are shown in comparison to Fidesz with arrows indicating a difference larger than one percentage point on the original scale.

It is notable that for several aspects, emphasis among the opposition peaks in 2010 or 2011 – the first years of the second Fidesz government – and declines over time. Most drastically, this is visible for the already mentioned constitution – where the peak in salience is likely a consequence of the adoption of the new constitution in April 2011. However, emphasis declines more profoundly for the opposition than for Fidesz later, which may lend credibility to the idea that the opposition could no longer use the constitution as a reference point. A closer look at the specific laws in connection to which the different principles were mentioned (see section in the Supplementary material) shows that in fact the new constitution was among the most relevant laws for all principles discussed here. For some principles, a second peak occurs around 2018. Remarkable is also the pattern for democracy where we see a re-emergence toward the end of the period of observation. Detailed Figures for the individual parties (in Figure A.7 in the Supplementary Material) mostly conform to the general trend but show that the second peak for democracy is most pronounced for DK but also occurs for Jobbik and is re-enforced by a high salience for Párbeszéd.

The comparison with salience values from the 1990s and 2000s also allows us to speak to the exceptionality of the current Fidesz government: For several of the principles, we see similar levels of salience at some point in the 1990s or early 2000s. Thus, the salience of democratic principles is high but not unprecedented. The pattern of an early peak during

Fidesz' reign or in some cases of a bimodal development is also a result of the low salience of all principles in the period right before Fidesz took office again. This is surprising, given Hungarian democracy already experienced severe challenges before the election with the resignation of prime minister Ferenc Gyurcsány after a leaked internal speech in 2006 had led to several years of harsh anti-governmental protests that were framed either as an attack on democracy or a defense of democracy against the socialist-liberal government (Ágh, 2013; Gessler & Kyriazi, 2019). One potential explanation for this pattern is that the opposition tried to 'sound the alarm' early on during the first year of the Fidesz government and ceased to do so later on. Once certain democratic principles have been violated, it may seem in vain to continuously call for the referee: the political game may now be too rigged to even complain about the government bending or changing the rules.

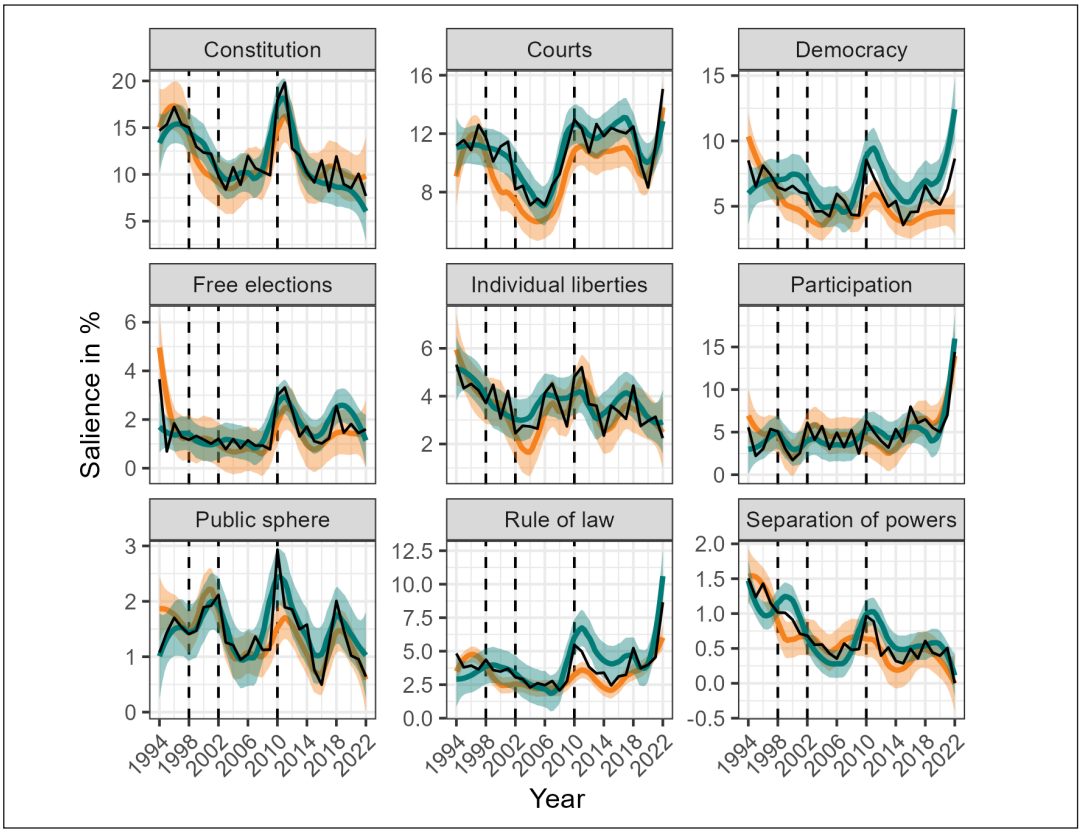

Figure 2 Salience of democracy over time. The colored lines show a smoothed average of all parties within each group. The solid black line shows the monthly moving averages of the whole parliament, irrespective of party affiliation.

4.2 Democracy rhetoric

Next, we proceed to analyze differences in the use of democracy rhetoric, that is, in which contexts the word 'democracy' and other forms of it are mentioned by both political camps. To ensure that speeches are substantively about democracy, we first hand-coded a

sample of ten opposition speeches per year mentioning the word stem 'democra*' to see whether they refer to domestic or international topics (a problem highlighted by Engler et al., 2022). From the coding, it is notable that almost all of these speeches concern domestic rather than international politics, although there are some instances of international topics brought forward by Jobbik in the first years of the Fidesz government.[6] Based on this, we can reasonably assume that a systematic investigation of the context surrounding democracy should allow us to judge how the concept of democracy is used. Hence, we proceed to investigate differences in the context of 'democracy' between Fidesz and the left-liberal opposition.[7]

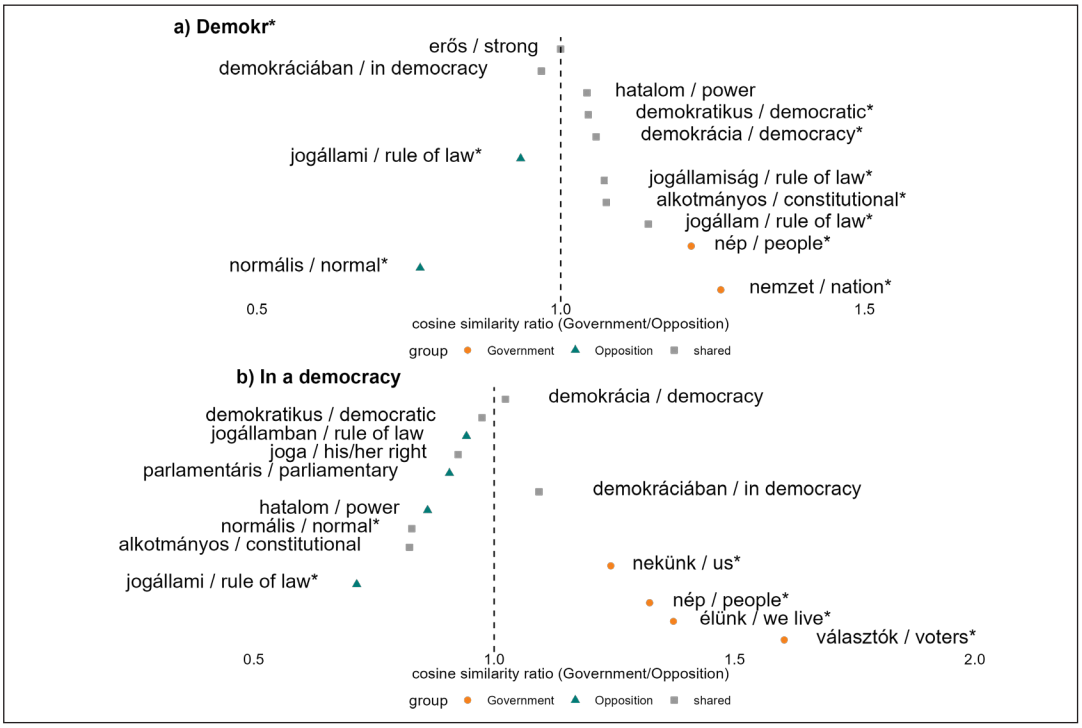

Figure 3 Nearest neighbor comparison for democracy word stem (including e.g., 'democracy' and 'democratic') and 'in a democracy'. The empirical p-values of words marked with an asterisk are significant at a 0.95 confidence level.

[6] In terms of substance, the majority of the speeches uses democracy to criticize Fidesz and the changes it has made to the democratic process. Especially in the first years, this includes criticisms of Fidesz' disregard for the parliamentary process. EU criticism of Fidesz is taken up – as suggested in the theoretical section – however, it constitutes a minority of the instances. In contrast, Fidesz also yields democracy as a criticism of the opposition – both criticizing past governments and the alleged unwillingness of the opposition to participate e.g. in the process of constitutional reform.

[7] For this analysis, we remove the speeches by Jobbik given the differences observed in the qualitative coding, as well as given that the party exhibits anti-democratic tendencies (Borbáth & Gessler, 2023; Pirro, 2018; Róna, 2016) that may make it not directly comparable to the other parties.

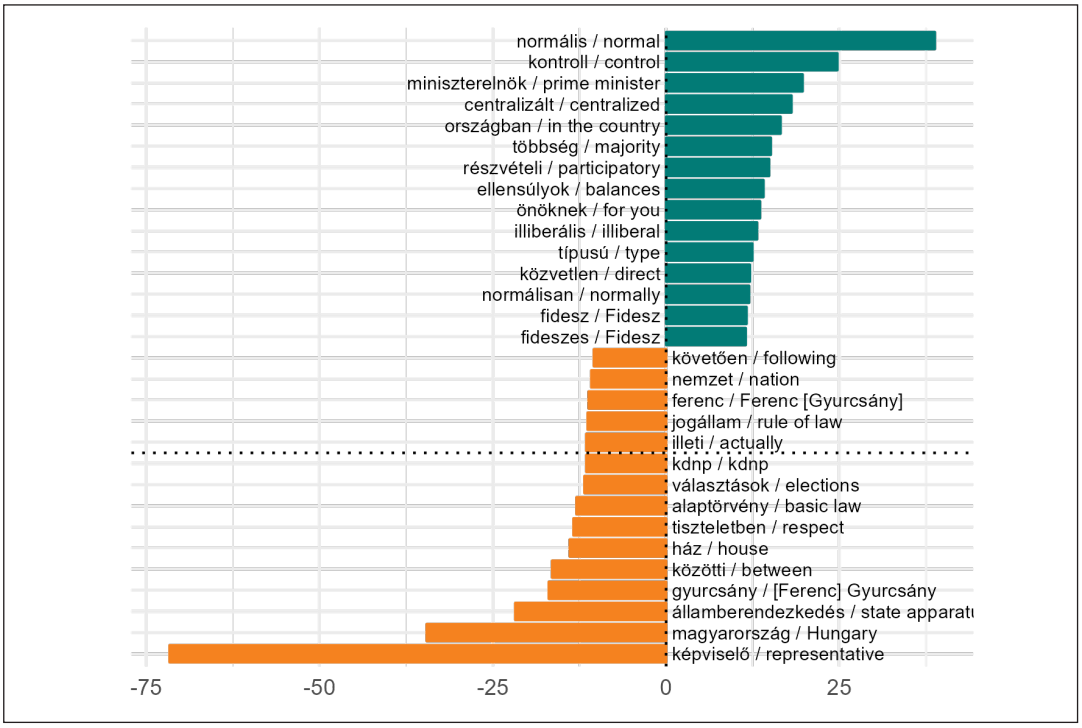

Figure 4 Contrast in contexts of word stem 'democr*' between the left-liberal opposition (turquoise) and Fidesz (orange).

Figure 3 plots the ten nearest neighbors each for the wordstem of democracy (demokr*), as well as for the more specific 'in a democracy' (*demokráciában*) for Fidesz respectively the left-liberal opposition parties. The horizontal position of each label indicates the ratio of similarity to the government over the similarity to the opposition. That is, a word on the left side of the plot is more similar to the opposition embedding of democracy, while a label on the right side is more similar to the government embedding. The colors and symbols mark whether the word is among the nearest neighbors for the government (orange), the opposition (turquoise) or both (gray). Detailed nearest neighbors for each party from the ALC-embedding – disaggregating the opposition group – are included in Table A.20 in the Supplementary Material.

Substantively, both Figures contain similar words, and the two groups share most of the nearest neighbors: for democracy, it is only 'the people' and 'nation' (Fidesz) respectively 'normal' and 'rule of law' (opposition) which are not shared, however, other word forms of the rule of law are nearest neighbors for both groups. For in a democracy there are 'us,' 'voters,' 'the people,' and 'we live' (Fidesz) respectively 'power,' 'rule of law' (in two forms) and 'parliamentary' (opposition). Hence, both embeddings show a similar picture: Democracy rhetoric is fairly similar for both sides with some differences along predictable lines: Democracy is equated with the rule of law more by the opposition who also uses 'normal' to contrast Hungary to 'normal democracies,' while Fidesz endorses a more populist version (the people, voters, nations, us). The slight differences we find are also

supported by the cosine similarity ratio which places aspects related to the nation and 'the people' closer to Fidesz but the word 'normal' and most words related to the rule of law closer to the opposition. This suggests that as expected, the opposition uses the concept of democracy to criticize the government, while the government uses it to legitimize its own power.[8]

The similarities in the nearest neighbors do not mean that democracy rhetoric across the two sides can be equated: Figure 4 replicates the analysis by Engler which contrasts words most typically used in the context around democracy for the government and the left-liberal opposition parties (see also Figure A.5 in the Supplementary Material for other dictionary categories). This analysis is conceptually slightly different from the nearest neighbors in Figure 3: Although context is also used for the estimation of word embeddings, nearest neighbors represent words with the most similar embedding to the word prompted. That is, the analysis identifies words used in a similar context. Differing from that, Figure 4 analyzes the context in which the word is used. That is, it shows words that cannot necessarily be used in place of the original word but accompany it (see e.g. the word 'highest' / *legfőbb* in the results for courts in the Supplementary Material). This summarizes the context in which the word is used with a different lens and allows us to identify additional differences in the use of the word. Moreover, in their comparisons, Figure 3 analyzes the nearest neighbors of democracy for each group separately and then compares these sets while Figure A.5 only highlights differences in the use based on a chi-square comparison of the two groups. Hence, the latter type of analysis will always return differences, regardless of existing similarities.

Looking at Figure 4, we indeed note contrasts that support the small differences already identified in the word embedding analysis. The opposition uses words like 'normal', 'control' and (checks and) 'balances' more in the context of democracy. The opposition also picked up the 'illiberal democracy' phrase introduced by Orbán but also highlights alternative forms of democracy, namely direct and participatory democracy. In contrast, most typical for the government's democracy rhetoric are words associated with governing (e.g., 'Hungary', 'state apparatus'). In fourth rank is the name of the head of the previous government, Ferenc Gyurcsány, which speaks for the use of democracy rhetoric when directly confronting the opposition that Fidesz often equates with Gyurcsány personally.[9] In the Supplementary Material, we additionally visualize the most frequent context words for democracy for each individual party in Figure A.9, as well as for democratic principles in the subsequent figures, however, party heterogeneity is again difficult to analyze as some of the opposition parties had limited speaking time in parliament.

[8] While differences of course exist, the general pattern is similar when using a pretrained model (see Figure A.8 in the Supplementary Material).

[9] Replicating the analysis with larger window sizes supports this interpretation with 'Ferenc' also becoming a key term. For some window sizes, 'Viktor' and 'Orbán' are also key terms for the opposition, providing evidence for the use of democracy rhetoric connected to the political opponent.

5 Conclusion

As Dahl has contended powerfully, 'a political party is the most visible manifestation and surely one of the most effective forms of opposition in a democratic country' (Dahl, 1966, p. 333). Hence, opposition parties are front and center when we think about opposing challenges to democracy by incumbent governments. However, the effectiveness of any opposition is diminished once opposition activity takes place outside of a democratic context. Changing the rules of the game by diminishing the opportunities of the parliamentary opposition to question the government or to shape the political agenda are a key challenge for opposing autocratization. This manuscript has provided a first cut at parliamentary rhetoric on democracy in a context of autocratization, focussing on the left-liberal opposition in the Hungarian parliament.

Several limitations of this manuscript may be relevant to consider for future work: First, the analysis of democracy rhetoric has mostly treated the left-liberal opposition as a unitary actor. Despite the differences that were revealed by the dictionary analysis and that we discussed in outlining the case, this was a methodological decision, as well as a compromise considering the short life span of some parties. While such a simplifying assumption allows clarifying broad discursive lines, future qualitative work could consider the differences between the parties in more detail as the ideological heterogeneity within the opposition camp may hide nuances. Moreover, the analysis has focused on the left-liberal opposition, often leaving out Jobbik as one of the most prominent opposition parties during that period.

Second, by focussing on the aggregate picture, the analysis could not discuss the specific contexts of each speech in detail. A particularly promising avenue here is a focus on the debates surrounding specific laws that can be reconstructed from the ParlText dataset used in the analysis. In this regard, we have listed laws in relation to which democratic principles were particularly frequently discussed in the Supplementary Material section. Particularly the debates around the new constitution stand out and provide ample material for a more in-depth analysis.

There are also methodological limitations: While the analysis used word embeddings to overcome some of the limitations of bag-of-words approaches, it still relies on a fairly simple model of word meaning. Future work could consider more advanced models of word meaning, including for the analysis of salience. Relatedly, the inclusion of policy content – e.g., from the Hungarian Comparative Agendas Project Dataset (Boda & Sebők, 2019) – may be useful to gain more detailed insights into the distribution of democracy appeals across issues and understand which laws are routinely criticized as anti-democratic. They may also help to differentiate further between how parties use democracy in their rhetoric ('democracy rhetoric') and the realities to which they refer.

Nevertheless, there are also already some important take-aways: Studying a case in which democracy is under attack, we have shown that democracy and democratic principles are a highly salient topic in the Hungarian parliament. In terms of opposition responses to autocratization, we have highlighted that on many dimensions, the opposition's emphasis exceeded that of Fidesz. This emphasis by the opposition could be evidence of a politicization of democracy. However, the high salience of the topic also for Fidesz and the similarity of both groups regarding democracy rhetoric suggest a different pattern of

politicization than for example on the immigration issue where challengers drive the salience of an issue and where parties take contrasting views. Instead, we show that democracy is discussed frequently, also to a lesser extent in the pre-Fidesz period, and by all actors.

Substantively, we observe some differences in 'democracy rhetoric' and small differences in the emphasis on principles. For rhetoric, they match the pattern outlined by Engler et al. (2022) of right-wing populist emphasis on participatory and left-liberal emphasis on liberal visions of democracy, however, this is not so clear for principles. Generally, differences are fairly nuanced with word embeddings of democracy for the government and the opposition showing significant overlap.

This also holds potential for conceptual and methodological reflection beyond the present study: In work on the politicization of democracy, democracy is often discussed as a valence issue that all parties support. The assumption that goes with this in previous literature is that politicization may not happen by actors openly opposing democracy, instead they may espouse different variants of democracy. We have addressed this assumption more head-on than previous research by explicitly analyzing 'democracy rhetoric,' namely the use of the word democracy, potentially for partisan purposes. Moreover, while the understanding of democracy as a valence issue is widely shared in the literature, many of the analysis tools used—such as the keyness statistics used by Engler et al. (2022)—focus on differences. Although differences between government and opposition do exist in the present study, a nuanced perspective shows that much of the use of democracy is shared between the two groups and concepts such as the rule of law are deeply engraved even into the discourse of Fidesz.

Nevertheless, it is important to highlight that overlap in the use of the concept does of course not mean Fidesz and the left-liberal opposition refer to the same ideas when referring to democracy or the rule of law. Referring to the rule of law more often does not make a government respect the rule of law more. Instead, this similar language use underscores that any critique of Fidesz' undemocratic policies needs to reference specific policies and be explicit in its criticism if it wants to counter Fidesz' democracy rhetoric and its wielding of democratic principles. That is, the vocabulary of democracy is highly codified, even in contexts where democracy itself is under attack.

Although the value of democracy is rhetorically undisputed, the concept seems to be caught in a general pattern of polarization in Hungary with parties using the word to criticize their opponent. The analysis over time has shown that the high salience of democracy is nothing new and democracy rhetoric was wielded in political debates – potentially as a tool for partisan polarization – long before Fidesz started dismantling political institutions. While we have not analyzed specific instances of democracy rhetoric, it is evident that its (de)legitimizing function may wear off if it is used too often or for transparently partisan purposes. In the present political situation, polarization proceeds with a highly unbalanced distribution of power: In a parliament where Fidesz can pass even those laws requiring a two-third majority without a single vote of the opposition, calling out undemocratic behavior is often in vain. This holds especially as opposition rights are curtailed and the parliament becomes less of a public stage: In a rigged game, crying foul is of no help when there is no impartial referee to heed these calls. Relating this to the warning of Cleary & Öztürk (2022) that escalating tactics may not pay off for democratic oppositions,

it seems plausible that the strong connection between debates around democracy and polarization in Hungary had diminished democracy's legitimacy as a tool for critiquing autocratization even before Fidesz (re-)took power.

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Analysis of the populist discourse of Lithuanian political parties

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Abstract

This article aims to analyse the populist discourse of Lithuanian political parties over a 30-year period: 1990–2020. Since Lithuania belongs to the CEE region, the question arises whether it is witnessing a worrying rise of populism and a related backsliding of democracy. Although Lithuania is currently a stable consolidated democracy, the lack of a stable party system and clear ideological cleavages during the transition to democracy in the 1990s created a favourable environment for populism to flourish. In this article, we analyse the changes in populist discourse in Lithuania across different actors, sources and over time. This is done by applying machine learning models to identify populist content at the paragraph level through a corpus of political party manifestos, political party websites, and columns written by party members on Delfi.lt. The results show that, although elements of populist discourse are present in the texts of all Lithuanian political parties, the overall level of populist discourse has remained fairly stable over the period analysed, with a temporary increase in 2008–2009. We observe that populist discourse is more widespread in the media than in party manifestos and that non-parliamentary parties engage in this discourse more than their parliamentary counterparts.

Keywords: populist discourse; machine learning models; political parties; Lithuania

1 Introduction

Recently, democratic backsliding has become a prominent research theme in Central and Eastern Europe (CEE), focusing on populist authoritarianism in Poland and Hungary, with its roots in the post-communist transformation. Although other post-communist countries have been studied less frequently, most of them (including Lithuania) started their democracy-building process while coping with a devastating economic downturn during the transition. Lithuania is now a stable consolidated democracy. However, since the transition to democracy in the 1990s, it has been characterised by the lack of a stable party system and clear ideological cleavages, creating a favourable environment for populism to flourish. The question therefore arises whether populism as a political strategy is on the rise in Lithuania, as in other Central and Eastern European countries.

Research on populism has long been dominated by case studies that aim to profile specific politicians or political parties (Grabow & Hartleb, 2013; Mudde & Kaltwasser, 2012). Only recently, the number of large-scale comparative studies that identify more general trends and patterns of populist discourse started increasing (Rooduijn & Pauwels, 2011; Rooduijn, 2014; Pauwels & Rooduijn, 2015; Rooduijn & Akkerman, 2017; Ernst et al., 2017; Manucci & Weber, 2017; Ernst et al., 2019; Bernhard & Kriesi, 2019). We contribute to this emerging literature by analysing large amounts of textual data over long periods, using a case that is rarely included in comparative research.

Understanding populism as a feature of discourse (Rooduijn, 2014), we conceptualise it as a discursive tactic used by different politicians. In this article, we analyse the changes in populist discourse in Lithuania over time to determine whether populist discourse is on the rise and, if so, whether this trend is consistent across different media and actors. This is done by applying machine learning models to identify populist content at the paragraph level through a corpus of three types of sources: political party manifestos, political party websites, and columns written by party members on 'Delfi.lt', the most prominent Lithuanian online news portal. Our corpus of texts covers three decades: 1990–2020. We break down each text into paragraphs and automatically code each paragraph as either people-centrist or anti-elitist. Then by aggregating these metrics by actor and year, we analyse how the pattern of populist discourse in Lithuania evolved through time.

The results show that elements of populist discourse are present in the texts of all Lithuanian political parties. However, the overall level of populist discourse has remained relatively stable over the period analysed, except for a temporary increase during the Great Financial Crisis of 2008–2009. Moreover, we observe that populist discourse is more widespread in the media than in party manifestos and that non-parliamentary parties engage in this discourse in manifestos more than their parliamentary counterparts. Despite the specific context, the insights go beyond a single case or the specificities of CEE countries and provide important incentives for further comparative empirical research on these dynamics across Europe. This study refutes the exclusivity of CEE and shows that the trends observed in Western European studies are also confirmed in this region, making further joint comparative research necessary. The text is structured as follows: in the first section, we present the overview of the previous research and our hypotheses. The second part describes the dataset we assembled for this study. In the third part, we present the results of our analysis.

2 The potential for large-scale discourse research

Populism is a contested concept: populist actors rarely use the concept to identify themselves, and instead, it is ascribed by others, usually with a negative connotation (Mudde & Kaltwasser, 2017). As populism expresses a response to context-specific grievances (Mudde & Kaltwasser, 2012; Gherghina et al., 2013; Gagnon et al., 2018), the ideological stance of populist actors ranges from the radical right to the radical left, to neopopulism (Shafir, 2013) or centrist populism in CEE countries (Stanley, 2017). While the variety of political actors complicates systematic comparisons, a sizable body of research is devoted to studies examining specific cases of interest. These studies typically focus on a single actor (mostly

a political party) and analyse its discourse (Reungoat, 2010), main ideological elements (Rydgren, 2008) or mobilisation strategies (Rydgren, 2004).

These analyses have produced a generally accepted understanding that populism is a set of ideas lacking fundamental values (Taggart, 2002) or an undeveloped thin-centred ideology with its specific concepts (Canovan, 2002). In addition, Cas Mudde (2004, pp. 543) has formulated the most often used definition: a thin-centred ideology 'that considers society to be ultimately separated into two homogeneous and antagonistic groups, "the pure people" versus "the corrupt elite", and which argues that politics should be an expression of the volonté générale (general will) of the people'.

Recently the approach changed, and the focus has shifted towards larger-n comparative studies, seeking instead to map the general trends and patterns of populist discourse across countries, periods, or sources. In such attempts, authors usually utilise a content analysis approach whereby they seek to identify populist content in text using various units of analysis like paragraphs (Rooduijn & Pauwels, 2011; Rooduijn, 2014; Pauwels & Rooduijn, 2015; Rooduijn & Akkerman, 2017), a statement (Ernst et al., 2017; Manucci & Weber, 2017; Ernst et al., 2019; Bernhard & Kriesi, 2019), an issue-specific claim (Bernhard et al., 2015), a sentence (Vasilopoulou et al., 2014) or a quasi-sentence (March, 2018).

Comparative analyses show that electoral manifestos are becoming more populist than in the past (Manucci & Weber, 2017; Schwörer, 2021). However, the results of populism in the media are contradictory. Some studies find that populism has become more prevalent in media debates (in newspapers) (Rooduijn, 2014; Hameleers & Vliegenthart, 2020), while others find that populist discourse is stable and with low prevalence (Manucci & Weber, 2017). Neither do studies of communication of populist actors over time reveal any substantial discursive explosion (Bernhard et al., 2015), and analyses of party websites (Schwörer, 2021) and press releases (Bernhard & Kriesi, 2019) do not support the contagion thesis.

Despite the increasing use of comparative studies, comparisons of the prevalence of populist discourse in manifestos and the media within the party system over time are still rare. Current comparative studies are limited to radical parties (Rooduijn & Akkerman, 2017) and often overlook how populist sentiments are used by mainstream parties in their discourse (exceptions include Schwörer, 2021; Rooduijn et al., 2014) and how populist discourse evolves over time. Moreover, it should be noted that the vast majority of studies analysing populist discourse focus on Western Europe (Rooduijn & Pauwels, 2011; Rooduijn, 2014; Manucci & Weber, 2017; Hameleers & Vliegenthart, 2020; Schwörer, 2021; Vasilopoulou et al, 2014) while CEE and other regions remain beyond the scope of the analyses.

One explanation for the limited comparative research to date is that classical content analysis is resource- and research-intensive, limiting the scope of comparative research that can be done. Some researchers seeking to simplify the process employed semi-automation tools (Caiani & Graziano, 2016; Ernst et al., 2017; Wettstein et al., 2018; Ernst et al., 2019). This mainly involved utilising a dictionary-based approach (Pauwels, 2011). Later studies have concluded that though these semi-automated approaches' reliability is somewhat lower than the classical content analysis, both approaches generate reasonably valid results (Rooduijn & Pauwels, 2011). With this in mind, we aim to find a way to conduct a comprehensive systematic analysis of populist discourse.

Recently, there have been particularly active attempts to use advances in machine learning and artificial intelligence for more comprehensive content analysis. It has been argued that these computational social science methods have the potential to produce in-depth insights at a massive scale, thus allowing even small research teams to carry out very large-n studies (Pukelis & Stančiauskas, 2019). Hawkins and Silva (2018) used an elastic-net regression for the supervised classification of party manifestos. Their model was able to identify very populist manifestos and very non-populist documents but did not perform very well on the documents in-between. A more recent attempt to measure populism using supervised machine learning by Di Cocco and Monechi (2022) has also generated somewhat successful results. Previous work has also demonstrated that machine learning models can be used to identify populist content in text with a high degree of accuracy (Ulinskaitė & Pukelis, 2021).

3 Defining, analysing, and explaining the prevalence of populist discourse

Despite the ongoing debate on the form of populism (strategy, discourse, or ideology), there is a consensus on the substance of populism. First, populist discourse divides society into homogeneous and antagonistic parts – the elites and the people (Mudde, 2004; Stanley, 2008; Pappas, 2016). Second, politics is defined as expressing the people's general will, expecting their direct participation in the decision-making process and arguing that all other mediating institutions and actors limit their governance (Arditi, 2007). Thirdly, since populism is intertwined with democracy (Canovan, 1999) and requires representative democracy to develop (Taggart, 2002), we consider populism as a gradual phenomenon, i. e. we cannot distinguish between parties that are entirely populist and completely non-populist.

Based on what has been presented and in line with Cas Mudde's (2004, p. 543) definition, we understand populist discourse as consisting of two essential components: people-centrism (speaking of 'the people' as a single entity with the same interests) and anti-elitism (the conviction that the current ruling elite is corrupt and acts against the interests of 'the people'). In this study, we also use this minimalist definition for two reasons. First, it allows us to go beyond the distinction between left- vs. right-wing populism, which is difficult to apply unequivocally to CEE. While nativism and anti-immigration attitudes are often linked to populism, studies that have analysed populism in the region in detail conceptualize it as neo-populism (Shafir, 2013) or centrist populism (Stanley, 2017), where the ideological core is particularly narrow. More in-depth qualitative research on populism in Lithuania confirms that populist ideology in the region is not embedded in more specific ideological attitudes (Ulinskaitė, 2020). Second, the vast majority of content analyses of larger amounts of data to date have used Mudde's definition to operationalise the concept of populism (Jagers & Walgrave, 2007; Pauwels, 2011; Rooduijn & Pauwels, 2011; Rooduijn, 2014; Balcere, 2014; Rooduijn et al., 2014; Rooduijn & Akkerman, 2015; Ernst et al., 2017; Payá, 2019; Elçi, 2019, Bernhard & Kriesi, 2019). We position this study in this tradition of content analysis.

Although these two components – people-centrism and anti-elitism – often appear together, they refer to different content elements and are therefore coded separately in our

analysis. We made this decision considering recent research on anti-establishment and populist politics in Central and Eastern Europe, which suggests that anti-systemic tropes are more prevalent in the discourse and are not necessarily broadly aligned with a people-centrist orientation (Engler et al., 2019). For this reason, we code the components of populism separately. For coding, we followed the instructions suggested by (Rooduijn & Pauwels, 2011). We coded a paragraph as people-centrist if it refers to a general category of the people as a homogeneous unit having favourable properties. It is important to distinguish when the author of the text refers to or society in general. Only when a paragraph refers to people, society, citizens, nation, instead of individuals, distinct groups of society (e.g. women, children, pensioners), we code it as people-centrist (e.g. 'This requires fundamental changes in the economy to ensure that it can support rising investment, job creation and better lives for people'). In addition, we code a paragraph as people-centrist when singular words such as a person or a citizen in the text refer not to a specific individual but an individual representing the whole. We identify anti-elitism if a paragraph refers to the elite as a homogeneous group having negative properties (e.g. 'Against corrupt politicians! For ordinary people!'). A paragraph is coded as anti-elitist when the criticism is generalised to the government, politicians, bureaucracy, oligarchy, financial, cultural, or academic elites. When criticism is expressed to specific political parties or officeholders, we do not consider it anti-elitism.[1]

In our approach, and in line with the minimalist approach, populism is primarily defined as a discursive strategy political actors use across the ideological spectrum. This strategy is best reflected in the discourse they shape. Therefore, drawing on theoretical conceptualisations, in this analysis, we consider populism primarily as a textual attribute rather than a characteristic of politicians (Rooduijn, 2014). By analysing the discourse, we can identify political parties that produce larger or smaller volumes of populist content.

Despite a fairly large body of existing research, we know relatively little about what factors could explain the volume of populist discourse the political parties employ. In this article, we aim to investigate if populism became more prevalent in political discourse. We already know that since the 1990s, populism has become more prevalent in political and media discourse due to globalisation and mediatisation (Mudde, 2004). Comparative analyses show that electoral manifestos are becoming more populist than in the past (Manucci & Weber, 2017; Schwörer, 2021). Considering that a lack of a well-structured party system and established ideological cleavages provided a fertile ground for populism to flourish in Lithuania, we hypothesise that levels of populism must have increased across both media sources and manifestos.

H1. Over time, the level of populism in the discourse of political parties, both in the media and in manifestos, increased.

[1] In the first phase of coding, two different coding techniques were used to code the data by the same researcher. The first coded people centrism and anti-elitism in relation to the entire content of the paragraph, while the second relied on a dictionary approach to test the reliability of the coding of people centrism. For this, the text was searched for words such as people, society, civil society, population, nation. Cohen's kappa varied from 0.75 to 0.92 (except for 0.5 for a manifesto of only several paragraphs). Given that the coding of the content of the whole paragraph is a more reserved coding principle than the dictionary principle, the correspondence of the coding is considered sufficient (see Pukelis & Stančiauskas, 2018).

We also compare the prevalence of populist discourse in official party documents as well as politicians' discourse in media sources, expecting to find more populism in the latter. Political parties' manifestos are the most important documents that articulate their vision of how policies should be implemented and communicate this vision to voters, media, and other politicians (Schwörer, 2021). Nevertheless, they are often formal, short documents, making it harder to detect populist features than in media articles. The intended audience explains the difference: the language is more vivid when communication is oriented towards the public sphere and the electorate (Pauwels, 2011).

Because of the immense importance of the media for electoral success, research on populism has also begun to look at populist communication and interaction with media (mainstream, fringe, social etc.). There seems to be a general consensus that media functions as a tool for populist politics to increase the popular vote (Mazzoleni et al., 2003). Moreover, the media provide populist politicians with the opportunity to disseminate their policies to a larger audience than just through manifestos (Wodak et al., 2013). Research shows that the mainstream media facilitate the visibility of populist actors by increasing their political appeal through sensational headlines. As a result, populist parties successfully employ media resources to 'build popularity and achieve electoral gains' (Norocel & Szabó, 2019; Kasekamp et al., 2019).

Many studies particularly focus on the broader media ecosystem and the place of populist media sources within it (see, for example, Szabó et al., 2019). In this paper, we instead follow the line of 'mainstreaming populism' and investigate the place of populist discourse in mainstream media. The 'mainstreaming of extremes' is observed when populist politicians are given more attention in the media, leading to the successful representation of their discourse in public debates (Feischmidt & Hervik, 2015; Norocel & Szabó, 2019). In this case, we expect that Delfi.lt, Lithuania's largest online news portal, will become an excellent venue for populist politicians to elaborate on their populist positions, which are less emphasised in manifestos.

H2: The level of populism in media content is more pronounced than in political manifestos.

Finally, previous studies show that populist communication is more pronounced in the discourse of more radical political parties (Rooduijn & Akkerman, 2017; Bernhard & Kriesi, 2019). Parties on the fringes of the political spectrum (Schmidt, 2017; Ernst et al., 2017; Schmuck & Hameleers, 2020), as well as new parties (Payá, 2019), are in a convenient position to criticise the political elite for being closed to outsiders, being malevolent and acting against the interests of the people. Therefore, political parties that are unlikely to form a government are expected to use populist discourse to attract the attention of voters strategically.

On the other hand, it is not clear whether this trend applies to the CEE region. When analysing CEE parties, research has found that many anti-systemic political parties are not based on ideological extremes but on the middle of the left-right scale (Engler et al., 2019). One plausible explanation is that centrist political parties are strongly populist but not extreme. On the other hand, they may also not be populist at all. Therefore, to investi-

gate this in more detail, we hypothesise that non-parliamentary parties, irrespective of their position on the ideological scale of right and left, generate more populist discourse in Lithuania.

H3: Populism is more prevalent in the discourse of non-parliamentary political parties than in that of parliamentary parties.

4 Data and Methods

4.1 Corpus of Lithuanian Political Party Texts

For this study, we have assembled an original dataset of Lithuanian Political Party texts. The corpus of texts consists of three main components: Political Party Election Manifestos (1992–2019), texts from 'Delfi.lt' section 'Through the eyes of a politician' (lt. *Politiko akimis*) (2005–2020) and texts from the websites of political parties (2018–2020). We consider the texts from 'Delfi.lt' and texts from the political party websites as our media corpus. We have collected over 30,000 paragraphs of manifestos and more than 133,000 paragraphs of media content (see Table 1).[2]

Table 1 Paragraph counts in media and manifesto corpora

	Paragraph Count	**Share in the final corpus (%)**
Manifestos	30 972	19
Media	133 303	81
Total	159 168	100

Source: Created by the authors

First, we started by collecting and processing the manifestos of political parties. We obtained party election manifestos for all the parties and the election periods that were available in the database of the Lithuanian National Electoral Commission or on the websites of political parties. Since these data sources did not cover the earliest elections in the 1990s, where possible, we supplemented that data with items from the Comparative Manifesto Project database. Table 2 lists the number of paragraphs in the manifesto corpus for each election period and the names of the parties with available manifestos for each election period. We use abbreviated party names in Table 2 and the rest of the paper. The mapping between the party names and their abbreviations can be found in Annex 1 of the paper.

[2] Data and code used in this paper can be found on GitHub (https://github.com/lukas-pkl/lt-populism).

Table 2 Size and coverage of Manifesto corpus

Election Year	Paragraph Count	Share in corpus (%)	Manifestos Covered
2020	7247	23.3	'DK', 'DP', 'KRIKSCIONIU_SAJUNGA', 'LLP', 'LLRA', 'LP', 'LRLS', 'LSDDP', 'LSDP', 'LVZS', 'LZP', 'Laisve_ Teisingumas', 'Lietuva_Visu', 'Lietuvos_Sarasas', 'NS', 'TS-LKD'
2016	6680	21.5	'DK', 'DP', 'LLP', 'LLRA', 'LRLS', 'LSDP', 'LVZS', 'LZP', 'Lietuvos_Sarasas', 'PUTEIKIS', 'TS-LKD', 'TT', 'TAUT'
2012	4387	14.1	'DK', 'DP', 'Front', 'LIC', 'LKP', 'LLRA', 'LRLS', 'LSDP', 'LVZS', 'Liaudies_Sajunga', 'Nacionalines_Vienybes_ Sajunga', 'Respublikonu_Partija', 'TS-LKD', 'TT', 'ZUOK'
2008	3459	11.1	'CP', 'DP', 'Front', 'LIC', 'LLRA', 'LRLS', 'LSDP', 'LSDS', 'Lietuvos_Rusu_Sajunga', 'NaujSaj', 'Pilietines_ Demokratijos_Partija', 'TPP', 'TS-LKD', 'TT'
2004	2099	6.7	'CP', 'DP', 'LIC', 'LKDP', 'LKP', 'LLRA', 'LSDP', 'LSDS', 'LVZS', 'Lietuvos_Kelias', 'Lietuvos_Sarasas', 'Respub-likonu_Partija', 'TS-LKD', 'TT', 'TAUT'
2000	3972	12.8	'LCS', 'LKDP', 'LKDS', 'LLRA', 'LLS', 'LPKTS', 'LRLS', 'LSDP', 'Liaudies_Sajunga', 'NaujSaj', 'TS-LKD', 'TAUT'
1996	2118	6.8	'LCS', 'LDDP', 'LDP', 'LKDP', 'LSDP', 'TS-LKD'
1992	1010	3.2	'LCS', 'LDDP', 'LDP', 'LKDP', 'LLRA', 'LPKTS', 'LSDP', 'TAUT'

Source: Created by the authors

The second source of data was the media texts authored by the party members from the largest Lithuanian web news portal 'Delfi.lt'. We have chosen this news portal due to several reasons. First, it is the most popular news portal among Lithuanians (Gemius, 2022). Second, it is the oldest still-functioning Lithuanian online news portal. Importantly, it has a large and accessible data archive going back to the early 2000s, which is a unique and valuable source of historical data. Third, Delfi.lt does not noticeably lean right or left (Jastramskis & Plepytė-Davidavičienė 2021) and the politicians from all major parties regularly publish there. We have collected data from the section called 'Through the eyes of a politician', which is dedicated to the media content authored by politicians. This data source covered the period from 2005 until 2021. We collected around 55,000 paragraphs of this type of media content (see Table 3).

Table 3 Size and coverage of Media corpus

Sources	Paragraph Count	Share in corpus (%)
delfi.lt/	54 667	41
tsajunga.lt/	24 445	18.3
darbopartija.lt/	18 577	13.9
lsdp.lt/	10 933	8.2
liberalai.lt/	6 238	4.6
lsddp.org/	5 942	4.4
lvzs.lt/lt/	5 655	4.2
awpl.lt/?lang=lt	5 200	3.9
propatria.lt/	1 373	1
tvarka.lt/	273	0.2
Total:	133 303	100

Source: Created by the authors

The third data source was news items and commentaries from the websites of the major political parties. We consider messages on the parties' websites to be media content. Unlike the opinion pieces on Delfi.lt, we believe that the texts are more oriented towards party members and supporters and, therefore, more often express the party line. We have chosen the websites of the largest Lithuanian political parties, which won two or more seats in the 2016 parliamentary elections.:

1. Homeland Union – Lithuanian Christian Democrats
2. Lithuanian Social Democratic Party
3. Lithuanian Farmers and Greens Union
4. Labour Party
5. Electoral Action of Poles in Lithuania – Christian Families Alliance
6. Liberals' Movement
7. The Social Democratic Labour Party of Lithuania (later Lithuanian Regional Party)
8. Party 'Order and Justice'

We sought to collect all the data available on the party website for these parties. However, the actual amount of collected data and the temporal coverage varied considerably from 24,445 paragraphs of the Homeland Union – Lithuanian Christian Democrats to 273 paragraphs of the Party 'Order and Justice'.

We also included the webpage of the movement 'Pro Patria' which is closely affiliated with the political party The National Alliance (lt. *Nacionalinis susivienijimas*). Though The National Alliance is not a major party, it is ideologically similar to Swedish Democrats and Polish PiS – archetypical populist parties. For this reason, we also deemed it valuable to include them in the analysis. A breakdown of the Media corpus by source can be found in Table 3.

5 Method of detecting populism in text

To identify the populist paragraphs in both corpora, we used a pre-trailed machine learning model. The procedure used to train the model, and its performance benchmarks are described in the methods note (Ulinskaitė & Pukelis, 2021). In short, we have assembled an extensive corpus of texts from various sources, including the manifestos of many political parties identified as populist in the literature. We then broke down these texts into paragraphs and manually labelled them. During the labelling, we looked for two distinct dimensions of populism – Anti-Elitism (AE) and People-Centrism (PC). Using the labelled data, we have developed a machine-learning model which would 'learn' to recognise PC or AE paragraphs in the new text.

To be more precise, for machine learning, we used the following approach: we vectorised (turned words into sequences of numbers) the texts using a pre-trained BERT model developed by Google Research (Devlin et al. 2018). BERT is a large transformer neural network pre-trained for natural language understanding tasks on Google Books corpus. Since its publication in 2018, BERT has been widely adopted for text-classification tasks, and several studies have demonstrated that BERT can outperform other commonly used approaches (González-Carvajal & Garrido-Merchán, 2020). After vectorising the input texts with BERT, we perform the actual classification using an ensemble of commonly used ML models: Logistic Regression, Naive Bayes, Support Vector Machines, MLP, and K-NN – all from Python's SKLearn library (Pedregosa et al., 2012). The ML model ensemble achieved F1 scores of 0.79 and 0.85 PC and AE, respectively. We chose this approach over using a fine-tuned BERT model because it offers more flexibility i.e. it allows adjusting the balance between precision and recall by tuning the hyper-parameters of the models, which would not be possible with the fine-tuned BERT model.

We used the same text pre-processing procedures for the Lithuanian corpora as for the training dataset used in model development. Before classification, all the texts in both corpora were broken into paragraphs, and each paragraph was automatically translated into English using Google Translate. This approach has been adopted because recent advances in Google Translate have enabled high-quality machine translation (Caswell & Liang, 2020). After translation, the pre-trained ML models were used to determine whether the paragraph could be classified as 'People-Centric' and/or 'Anti-Elitist' – two constituent dimensions of populism we use in our approach.

Prior to the main analysis, we performed a separate evaluation to assess the extent to which the model can successfully label texts from the Lithuanian political parties. We already had some Lithuanian party manifestos from the 2016 and 2020 elections coded using this scheme (Ulinskaitė, 2020), and we could use this dataset to validate the model performance. The model performed reasonably well, with an F1 score of ~0.9 for each dimension.

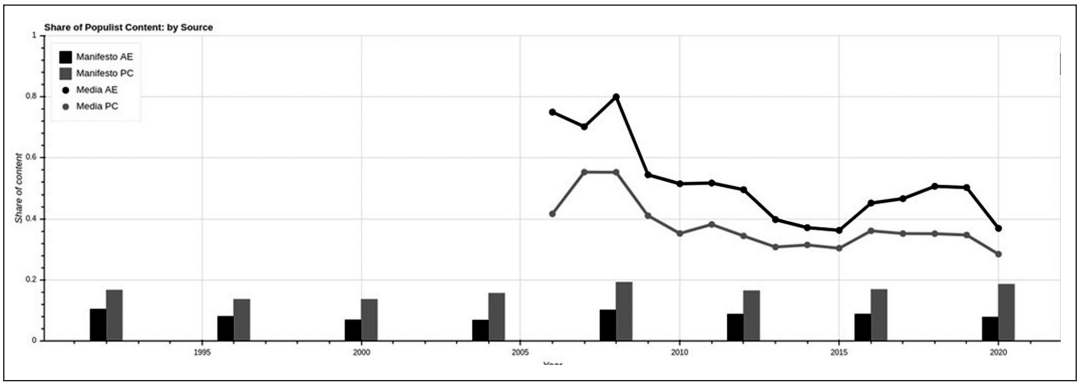
In the analysis section, we will present the results as they were coded, i.e. we will maintain the distinction between the anti-elitism (AE) and people-centrism (PC) as two dimensions of populism. We find this distinction significant because the two dimensions do not necessarily follow the same trends, and populist parties might express more people-centrism than anti-elitism (or vice versa) in some cases and not in others.

6 Results

6.1 Comparing populism prevalence in media and in manifestos

We start our analysis with an overview of the change in the amount of people-centrist and anti-elitist paragraphs over time in two data sources – manifestos and media (see Figure 1). The x-axis represents time, while the y-axis indicates the share of content. The results from the manifesto corpus are presented as bar charts, while the media corpus results are represented as line graphs. The people-centrism (PC) results are in lighter grey, and the anti-elitism (AE) results are in black.

Figure 1 Share of populist content in party manifestos and media

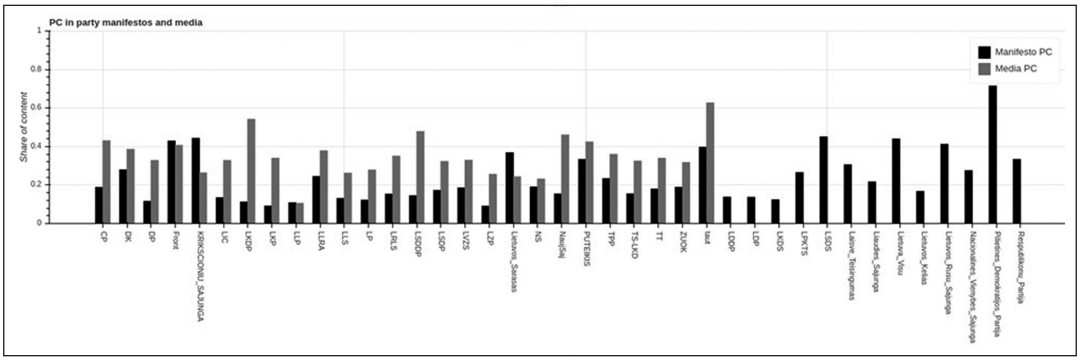


Source: Created by the authors

The graph shows that the level of populist statements in the discourse of Lithuanian political parties, contrary to expectations, has remained stable over time. This trend is particularly pronounced in party manifestos, where the proportion of people-centrist and anti-elitist paragraphs has never exceeded a fifth of the total. The manifestos of Lithuanian political parties are more people-centrist than anti-elitist. Meanwhile, the proportions of people-oriented and anti-elitist paragraphs in media content are reversed: in the media, politicians are more likely to criticise the elite than to address the people. As observed in previous studies (Pauwels, 2011), the overall proportion of populist content in the media is consistently higher than in party manifestos.

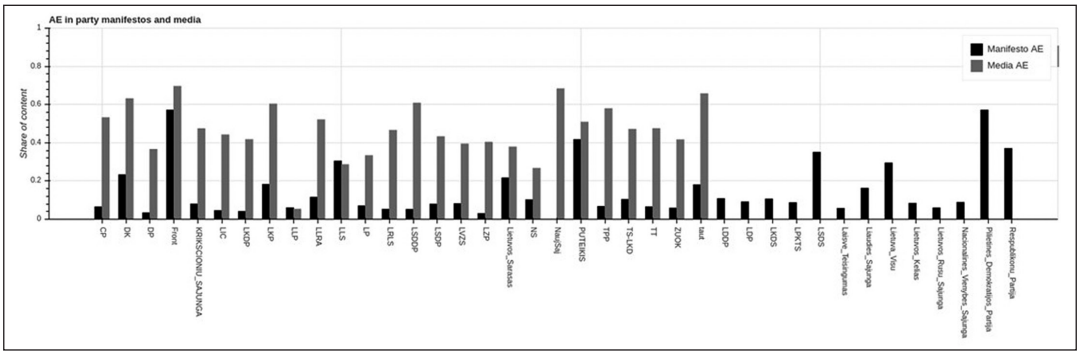
When we break the results down by the political party, we see that the political parties popularly dubbed as being populist, namely the Socialist People's Front, the Puteikis-Krivickas Coalition Against Corruption/Puteikis+, the Lithuanian Nationalist and Republican Union and the Political party 'The Way of Courage', have the highest shares of both people-centrism and anti-elitism both in media content and in manifestos. Overall, we find more populist paragraphs in media content than in the manifestos, except for people-centrism in the manifestos of the Socialist People's Front, the Christian Union and the Political party 'Lithuanian List' and anti-elitism in The Liberal Union of Lithuania. The only political party that was more populist in its manifesto but mainstream in its media content turned out to be the Political party 'Lithuanian List'. See Figures 2 and 3.

Figure 2 People-centrism by party



Source: Created by the authors

Figure 3 Anti-elitism by party



Source: Created by the authors

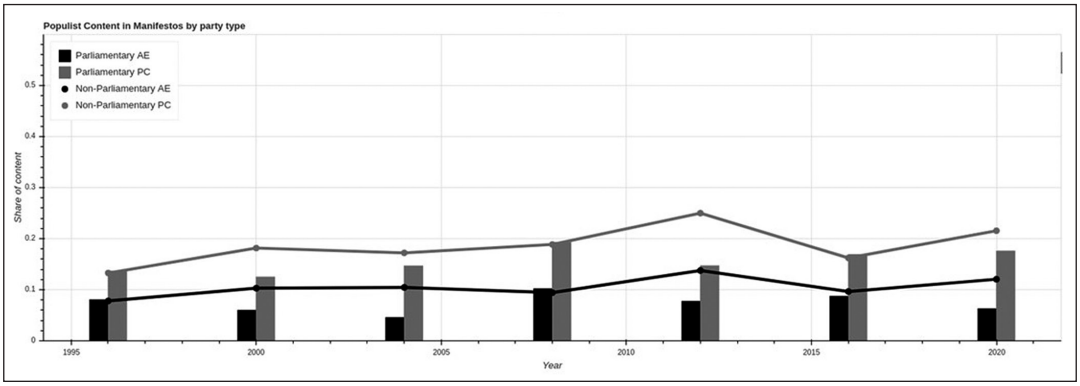
Regarding anti-elitism, in the media political parties are much more likely to be critical of elites than express people-centrism. Moreover, in many cases, the intense criticism of the elite in the media does not necessarily translate into manifestos: we see that, in terms of anti-elitism, manifestos often lag far behind the content of the media.

The results also reveal that the Lithuanian political parties most often considered populist in comparative studies – the Labour Party and the Party 'Order and Justice' – do not seem discursively different from other political parties. It is evident that Party 'Order and Justice' is slightly more people-centrist than other political parties but is not more critical of the elite in general. Nor do the manifestos of the Labour Party seem to be more populist than those of other political parties. Although unexpected, these results are in line with previous studies (Ulinskaitė, 2021), showing that political parties the Labour Party and the Party 'Order and Justice', most often identified as populist in the research, did not have strong populist features in their manifestos. A possible interpretation of the results is that both parties, based on the charisma of strong leaders, are generating much more populist discourse in social media and face-to-face interactions with voters, rather than in traditional data sources such as websites, traditional media and manifestos. This only confirms once again the chameleon-like nature of populist organizations and politicians. On the other hand, it can also be suggested that populist sentiment is often assessed not in terms of the volume of discourse but in terms of its radicalism.

An interesting case is the discourse of Electoral Action of Poles in Lithuania – Christian Families Alliance, an ethnic minority party, which is still one of the most anti-elitist among the parliamentary parties. The party's manifestos have been among the most people-centrist of the parliamentary parties analysed. The result is paradoxical, indicating that ethnic minority parties can address both the specific minority they represent and the people in general. It seems that representing a minority and the people's general will is not contradictory in this case.

Finally, in Figure 4, we compare the parliamentary and non-parliamentary parties. We considered the party parliamentary if it won at least two mandates during the parliament election. The Figure shows that the manifestos of the non-parliamentary parties contain more people-centrist and anti-elitist paragraphs than those of the parliamentary parties in 4 out of 7 elections. However, the differences are relatively small.

Figure 4 Populism in the discourse of parliamentary and non-parliamentary parties



Source: Created by the authors

The populist discourse in the manifestos of non-parliamentary parties was at its peak in 2012. Before the parliament elections, two political scandals broke out, leading to anti-establishment protests and the emergence of two new political parties – the Political party 'Lithuanian List' and Political party 'The Way of Courage.' The latter managed to win seven seats in the 2012 Seimas elections (The Central Electoral Commission of the Republic of Lithuania, 2012). In addition, several new anti-establishment parties took part in the elections, such as The Emigrant Party or the 'For Lithuania in Lithuania' party. However, none of them managed to cross the five per cent threshold to enter parliament.

7 Explaining the prevalence of populist discourse

The next step of our analysis was conducting an OLS regression analysis of our data. Here the unit of analysis is a single document from our corpus. We ran two sets of models with two different dependent variables: in one set, the dependent variable was the share of anti-elitist content in the document, while in the second set, that was the share of the people-centric content in the document.

In all models, we used a dummy variable 'Manifesto' to denote whether the document is a party electoral manifesto. We also used a dummy variable for whether the party had any seats in the parliament at the time of document publication. The third set of factors relates to time. In the first set of models, we use 'Years after independence' obtained by subtracting 1990 from the year of document publication. In the second set of models, we use two-decade dummies: 'First decade' (1990–2000) and 'Second decade' (2000–2010). In the third set of models, we use a dummy for the period of the Great Financial Crisis (2008–2010). The results of the analysis are presented in Table 4 below.

Table 4 Results of OLS regression analysis

	Anti-Elitism			**People-Centrism**		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Manifesto	−0.25 (0.04) ***	−0.39 (0.05)***	−0.33 (0.04)***	−0.13 (0.03)***	−0.1 (0.04)*	−0.1 (0.03)**
Parliamentary party	0.08 (0.02)***	0.08 (0.02)***	0.08 (0.02)***	0.06 (0.01)***	0.06 (0.01)***	0.06 (0.01)***
Years after independence	0.01 (0.001) ***			−0.003 (0.001)**		
First decade		0.05 (0.1)			−0.1 (0.1)	
Second decade		0.18 (0.05)**			−0.02 (0.05)	
Financial crisis			0.21 (0.07)***			0.02 (0.06)
R^2	0.01	0.01	0.01	0.003	0.003	0.003
N	16 567	16 567	16 567	16 567	16 567	16 567

*** $p < 0.001$, ** $0.001 < p < 0.01$, * $0.01 < p < 0.05$

Source: Created by the authors

The first thing to note is that the explanatory power of our model (R^2) is relatively low. However, this is to be expected as the model contains only a few systematic independent variables. The explanatory power of the model could likely be increased by adding party-level variables, such as the parties' positions on the economic left-right or GAL-TAN scale or variables related to whether a party was in the ruling coalition at the time of publication of a given text. However, these steps are beyond the scope and objectives of this article. Our aim here is to understand the broad patterns and tendencies in the Lithuanian political system as a whole rather than to explain what factors explain the level of populism in the discourse of a particular party.

The results provide mixed support for our hypotheses. First, we see that for the dimension of anti-elitism (AE) 'Year after independence' has a significant effect in the first model. However, this effect is relatively small and statistically significant only due to a very large sample. Furthermore, the second and third models show that the effect is not linear – in the second decade of independence or, more precisely, during the Great Financial Crisis, there was an upsurge of anti-elitism in the discourse of Lithuanian political parties. This is in line with previous studies that have shown that during the Great Finan-

cial Crisis, there was a stronger than usual anti-elitist sentiment, which led to a harsher than usual electoral punishment of the incumbent parties (Talving, 2017; 2018). We do not observe any significant effect of the time dimension on the people-oriented (PC) component of party rhetoric.

However, we note a slight increase in both people-centrist and anti-elitist paragraphs in the 2008 election manifestos and media. This increase probably reflects the debate during the financial crisis, when parties often referred to the common good of the people in their rhetoric. However, we can see that 2007–2008 is more of an exception and that the level of populist discourse has remained stable since the 1990s. Therefore, we do not confirm H1.

Nevertheless, the models strongly support our second hypothesis. Indeed, we see that the 'Manifesto' dummy has a strong negative and significant effect in all models. This means that both dimensions of populism are significantly less present in electoral manifestos. We also observe that the effect size of the AE dimension is larger than that of the PC dimension. This implies that especially the anti-elitist rhetoric is toned down in the manifestos. We can speculate that this happens because political parties try to appear more pragmatic and professional in their manifestos. An alternative explanation would suggest that political parties are more inclined to criticise a specific part of the political elite, i.e. their opponents, rather than the elite as a whole.

Finally, the parliamentary party dummy has a significant effect in all models. However, the effect is in the opposite direction. We suspect this is due to the large number of media texts in our dataset (which contain more populist content and are more often published by parliamentary parties). Therefore, we re-sampled the models using only party manifestos (Table 5). The results are in line with our expectations – in the manifesto corpus, the effect runs in the expected direction, with the non-parliamentary parties having significantly higher shares of the populist content in both dimensions.

Table 5 Results of OLS regression analysis (manifestos only)

	Anti-Elitism			**People-Centrism**		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Parliamentary party	−0.1257 (0.028)***	−0.1263 (0.028)***	−0.117 (0.028) ***	−0.074 (0.03)*	−0.072 (0.03)*	−0.057 (0.03)
Years after independence	0.0025 (0.002)			0.005 (0.002)**		
First decade		−0.08 (0.042)			−0.14 (0.005) **	
Second decade		−0.014 (0.03)			−0.046 (0.035)	
Financial crisis			0.03 (0.04)			0.022 (0.04)
R^2	0.176	0.188	0.16	0.103	0.109	0.032
N	100	100	100	100	100	100

*** $p < 0.001$, ** $0.001 < p < 0.01$, * $0.01 < p < 0.05$

Source: Created by the authors

8 Conclusions

In this article, we aimed to contribute to the emerging trend of larger-n comparative studies of populism by analysing the populist discourse of Lithuanian political parties in the period 1990–2020. We conceptualise populism as a feature of discourse rather than a speaker, and we assume that all political parties can use populist discourse to some extent. We operationalise populism as consisting of two dimensions – people-centrism and anti-elitism – which we code and analyse separately.

The paper used an original dataset of Lithuanian political party texts and performed large-scale quantitative text analysis using a pre-trained machine-learning model. This approach allowed us to carry out a very large-scale analysis across a long period of time and cover a vast majority of the Lithuanian political parties – a feat that would have been impossible otherwise.

Our results show that, contrary to our expectations, the level of populism has not increased over time. In fact, we observe that during the period of the Great Financial Crisis (2008–2010), anti-elitist rhetoric increased. However, it is important to note that during the crisis, we have only seen an increase in one dimension of populism – anti-elitism – while the second dimension of populism – people-centrism – has not increased significantly.

In addition, we also found that, as in previous studies on other contexts, parties are significantly more likely to use populist rhetoric in the media compared to party manifestos. This is probably related to political parties trying to appear professional and pragmatic in their manifestos. We also find evidence that the proportion of populist content in the manifestos of non-parliamentary parties is higher in both dimensions. The populist discourse in the manifestos of non-parliamentary parties was at its peak in 2012, during the elections after the Great Financial Crisis, probably culminating in the aftermath of the recession.

Despite its specific context, this study refutes the exclusivity of CEE and shows that the trends observed in Western European studies are also valid in this region. Therefore, these results are not limited to a single case or the specificities of the CEE countries and provide an important stimulus for further comparative empirical research.

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Annex

Annex Mapping between the party names and abbreviations

Party Name	Party Name EN	Abbreviation
Centro Partija	Center Party	CP
Drąsos Kelias	Way of Courage	DK
Darbo Partija	Labor Party	DP
Frontas	Socialist Popular Front	Front
Krikščionių Sąjunga	Christian Union	KRIKSCIONIU_SAJUNGA
Liberalų Centro Sąjunga	Liberal-Center Union	LIC
Lietuvos Krikščionių Demokratų Partija	Lithuanian Christian-Democratic party	LKDP
Lietuvos Krikščionių Partija	Lithuanian Christian Party	LKP
Lietuvos Liaudies Partija	People's Party	LLP
Lietuvos Lenkų Rinkimų Akcija	Polish Electoral Action	LLRA
Lietuvos Liberalų Sąjunga	Liberal Union	LLS
Laisvės Partija	Freedom Party	LP
Lietuvos Respublikos Liberalų Sąjūdis	Lithuanian Liberal Movement	LRLS
Lietuvos Socialdemokratinė Darbo Partija	Lithuanian Social Democratic Labor Party	LSDDP
Lietuvos Socialdemokratų Partija	Lithuanian Social Democratic Party	LSDP
Lietuvos Valstiečių Žaliųjų Sąjunga	Lithuanian Union of Greens and Farmers	LVZS
Lietuvos Žaliųjų Partija	Lithuanian Green Party	LZP
Lietuvos Sąrašas	Lithuania's List	Lietuvos_Sarasas
Nacionalinis Susivienijimas	National Union	NS
Naujoji Sąjunga	New Union	NaujSaj
Antikorupcinė Puteikio ir Krivicko Koalicija / Puteikis+	Puteikis-Krivickas Coalition Against Corruption/Puteikis+	PUTEIKIS
Tautos Prisikėlimo Partija	National Resurrection Party	TPP
Tėvynės Sąjunga	Homeland Union	TS-LKD
Tvarka ir Teisingumas	Order and Justice	TT

Party Name	Party Name EN	Abbreviation
Lietuvos Laisvės Sąjunga (liberalai)/ TAIP	Lithuanian Freedom Union/ YES	ZUOK
Tautininkų Sąjunga	Nationalist Union	TAUT
Lietuvos Demokratinė Darbo Partija	Lithuanian Democratic Labor Party	LDDP
Lietuvos Demokratų Partija	Lithuanian Democratic Party	LDP'
Lietuvos Krikščionių Demokratų Sąjunga	Lithuanian Christian Democratic Union	LKDS
Lietuvos Politinių Kalinių ir Tremtinių Sąjunga	Union of Political Prisoners and Deportees	LPKTS
Lietuvos Socialdemokratų Sąjunga	Lithuanian Social Democratic Union	LSDS
Laisvė ir Teisingumas	Freedom and Justice	Laisve_Teisingumas
Liaudies Sąjunga	Popular Union	Liaudies_Sajunga
Lietuva Visų	Lithuania for Everyone	Lietuva_Visu
Lietuvos Kelias	Lithuanian Way	Lietuvos_Kelias
Lietuvos Rusų Sąjunga	Lithuanian Russian Union	Lietuvos_Rusu_Sajunga
Nacionalinės Vienybės Sąjunga	Union of National Unity	Nacionalines_Vienybes_ Sajunga
Pilietinės Demokratijos Partija	Civic Democracy Party	Pilietines_Demokratijos_ Partija
Respublikonų Partija	Republican Party	Respublikonu_Partija

Zsófia Rakovics* & Ildikó Barna**

Jobbik's journey from radicalism to mainstream politics: Analyzing the parliamentary speeches of Jobbik and the dynamic network of its politicians between 2010 and 2020

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Abstract

Exploring the substantial influence wielded by politicians in shaping social reality and molding the public perceptions of the country may be beneficial from a social scientific point of view. Our research delves into the distinctive realm of parliamentary discourse to unravel this intricate process.

We focus on the transformative role of politicians and political parties within the public political sphere. Through an innovative approach, linguistic similarities in parliamentary speeches are harnessed to unveil the strategies of political communication, the dynamics of power dynamics, and the myriad modes of interactions.

Our research puts the spotlight on Jobbik – Movement for a Better Hungary, a notable far-right party that has navigated a decade of political success in Central and Eastern Europe. Gaining a substantial share of the vote in national elections, Jobbik's evolution from its radical right-wing origins to a moderate conservative people's party is the subject of scrutiny. Leveraging techniques such as natural language processing, document embedding, social network analysis, and structural topic modeling, the study dissects Jobbik's journey from radicalism to mainstream politics.

We uncover the transformation of Jobbik through a meticulous analysis of parliamentary speeches and the use of quantitative analytical tools. We not only reveal the evolution of Jobbik's identity but also contribute to a deeper understanding of the intricate interplay between political communication and power dynamics.

Keywords: Jobbik, parliamentary speeches, natural language processing, document embedding, structural topic modeling, social network analysis

1 Introduction

Politicians play an influential role in the construction of social reality and in shaping the public perception of a country. They both influence and are influenced by the political polarization of society. Therefore, by studying the political speeches of the members of the country's parliament, we gain unique insights into this process and society.

The dynamic network of politicians and political parties reveals information about their role in the political public sphere. Constructing networks based on the linguistic similarity of their parliamentary speeches is fruitful for examining their communication strategies, identifying patterns in how political power operates, and the various modes of interaction.

Jobbik – Movement for a Better Hungary *(Jobbik Magyarországért Mozgalom)*[1] has been one of the most successful far-right parties in the past decade in the Central and Eastern European region, obtaining 17 and 20 percent of votes, respectively, in the Hungarian national elections of 2010 and 2014. Jobbik was founded in 2003, became a major political actor in 2009, and after 2014, strived to change its image to be seen as a more centrist, less radical actor, a mainstream conservative people's party.[2]

Studying Jobbik's transformation is insightful not only for the East-Central European region but also in a broader context for various reasons. Initially known for its far-right ideologies, the party tried to reposition itself as a more centrist force, distancing itself from its far-right past. The party is known for its nationalist and populist agenda, focusing on issues like national identity, EU skepticism, criticisms of globalism, and anti-immigration – topics now familiar to the Central and Eastern European region and worldwide. As issues of democratic regression and the erosion of institutions became more prominent in some Eastern European countries, including Hungary, Jobbik's stance on these issues attracted attention and contributed to debates on the state of democracy in the region. Jobbik's journey encapsulates a case study of the adaptability and strategic repositioning of political parties in response to changing electoral landscapes. This transformation highlights the dynamic nature of political identity and strategy and illustrates how parties on the radical right can undergo significant ideological shifts to broaden their appeal and enhance electoral viability.

Our research involved analyzing the parliamentary speeches of Jobbik politicians to examine their political communication and the evolution of the organization. We aimed to describe the main characteristics and dynamics of Jobbik, which has turned from a radical, far-right standpoint into a people's party. For this, we used natural language processing, document embedding, social network analysis, and structural topic modeling.

First, we constructed the document representation of the corpus, embedding the speeches in an abstract vector space in which the relationships between speeches and party representatives could be mapped. Second, we built a network based on the similarities in speeches in the document, embedding space for each political term. Third, by considering the time dimension, we generated a dynamic network of party members based on their parliamentary speeches, which we analyzed using social network analysis. Finally, we used structural topic modeling to identify prevalent topics in each parliamentary term and the evolution of these over time.

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[1] At the party congress in 2023, the decision was made to change the party's name to Jobbik – Conservatives *(Jobbik – Konzervatívok)*.

[2] Gábor Vona discussed the transformation into a people's party at Jobbik's June 2014 party congress, with the aim of reaching a broader spectrum of voters. In his words, 'those who operate a subculture will remain within a subculture' (Vona, 2017, 16:41). The term 'people's party' *(néppárt)* and the process of becoming a people's party *(néppártosodás)* have been adopted in the literature on Jobbik (for example, Bíró-Nagy & Boros, 2016; Héjj, 2017; Kovarek & Farkas, 2017; Róna, 2016; Szabó, 2019). In our study, we also use the term in the aforementioned sense.

To drive our analysis, we formed the following research questions:
- What are the main characteristics and dynamics of Jobbik, which has changed from a radical, far-right standpoint to a mainstream people's party?
- Can we observe the signs of internal conflicts and fault lines between the party representatives of Jobbik using quantitative text analytical tools and social network analysis based on the parliamentary speeches of Jobbik MPs?
- What topics characterize the parliamentary speeches of Jobbik's MPs? What are the temporal dynamics in the prevalence of these topics?

2 Theoretical background

2.1 The beginning and Jobbik's road to the Hungarian parliament

Jobbik's predecessor was the Right-wing Youth Community (*Jobboldali Ifjúsági Közösség*, Jobbik for short), founded in 1999 by college and university students to bring together nationalist-minded youth in response to their frustration with the political elite. The organization became a party in 2003 under the name Movement for a Better Hungary *(Jobbik Magyarországért Mozgalom, Jobbik)*.[3] The timing is no coincidence: the right-wing conservative Fidesz lost the 2002 elections, and the first far-right party in Hungary, the Hungarian Justice and Life Party *(Magyar Igazság és Élet Pártja, MIÉP)*, failed to meet the threshold to enter parliament. In the 2006 parliamentary elections, an alliance between Jobbik and MIÉP won only 2.2 per cent of the vote. After this failure, Jobbik dissolved the alliance and started to find its own voice. It is worth noting, though, that following this disappointing election outcome, Jobbik secured electoral reimbursement, which constituted a substantial financial asset for the party (Pirro, 2019). The party's growing impact became clear in the 2009 European Parliament elections. Jobbik won almost 15 per cent of the vote and was able to send three members to the European Parliament. In the 2010 parliamentary elections, Jobbik won 17 per cent of the vote, immediately becoming the third strongest party in parliament, less than three percentage points behind the Hungarian Socialist Party *(Magyar Szocialista Párt, MSZP)*, which won the second most votes.

A significant amount of analysis has been dedicated to unraveling the factors behind the 'secret of Jobbik's success' (Jeskó et al., 2012; Karácsony & Róna, 2010). The analyses have identified several factors: the match between the supply of and the demand for the far-right (Krekó & Juhász, 2017), the appropriation of the 'Roma issue' (Kim, 2016, pp. 3–4, 6–7; Krekó & Juhász, 2017; Krekó & Mayer, 2015, pp. 190–191; Goldstein, 2021, pp. 26–27), the prolonged political crisis starting in 2006[4] (Krekó & Mayer, 2015, pp. 189–190; Héjj, 2017, p. 84; Pirro, 2019, p. 157; Szabó, 2019, pp. 153–155), the Hungarian and world economic crises (Enyedi, 2015; Grajczjár & Tóth, 2010).

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[3] See also n. 1 above.

[4] The crisis started when in mid-September the speech commonly known as the 'Őszöd Speech,' delivered by recently re-elected Prime Minister Ferenc Gyurcsány, was leaked. He gave this speech following his electoral victory while addressing a closed meeting of the Hungarian Socialist Party parliamentary group in Balatonőszöd. In this speech, PM Gyurcsány admitted that the Hungarian Socialist Party had lied during the electoral campaign and made false electoral pledges. Some of the phrases from the speech (e.g., *'hazudtunk éjjel, hazudtunk nappal'* [we lied at night, we lied during the day] and *'elkúrtuk'* [we screwed up]) have been used as catchphrases by the opposition.

However, there are two factors that are particularly relevant to our analysis that have significantly contributed to Jobbik's success. First, the utilization of the internet and the launch of the radical news portal Kuruc.info in 2006, which by 2009 became the third most visited Hungarian news site (Barlai, 2012; Barna & Knap, 2019; Bíró-Nagy & Boros, 2016, pp. 257–258; Molnár, 2015; Pirro & Róna, 2019; Róna, 2016). Second, the extremist paramilitary organization known as the Hungarian Guard *(Magyar Gárda),* which was founded in 2007[5] (Barna, 2017; Barna et al., 2018; Róna, 2016; Szabó, 2019, pp. 151–153). Jobbik also had close links with several other far-right organizations (Sixty-Four Counties Youth Movement *[Hatvannégy Vármegye Ifjúsági Mozgalom]*[6] and the Outlaws' Army *[Betyársereg]*[7]). According to Kitschelt's definition, '[m]ovement parties are coalitions of political activists who emanate from social movements and try to apply the organizational and strategic practices of social movements in the arena of party competition' (Kitschelt, 2006, p. 280). In this sense, Jobbik was a movement party at this time.

Jobbik 'was largely ignored by mainstream mass media and was therefore driven towards alternative solutions of communication on the internet' (Hyttinen & Näre, 2017, p. 238). Therefore, Kuruc.info and the frequent gatherings and demonstrations of the Hungarian Guard served as channels for successfully conveying their message to voters, which clearly contributed to it becoming a parliamentary party (Bíró-Nagy & Róna, 2013, pp. 3–4, 20–21). Bernáth (2014) pointed out that despite the mainstream media treating Jobbik representatives as *persona non grata*, 'the weakness of professional dialogue related to extremists, the extremist politicization of the issue, and sometimes routine habits' can contribute to the expansion of far-right discourse. Szabó and Bene (2015) came to a similar conclusion when they analyzed the positions of radical right media within the general media sphere.

At the same time, the left-wing parties pursued a *cordon-sanitaire* strategy. 'Correspondingly, left-wing politicians did not participate in any public debate with Jobbik politicians and did not challenge the politics of Jobbik, but simply called it "fascist" and "extremist"' (Bíró-Nagy & Boros, 2016, p. 256). 'However, it turned out very soon that the cordon sanitaire strategy not only did not stop the rise of the far-right party but actually helped to spread its political messages without any counterpoint or criticism' (Bíró-Nagy & Boros, 2016, p. 257).

2.2 Jobbik as a parliamentary party

Jobbik faced new challenges when it entered parliament. Parliamentary politics put the party under pressure: it had to change from a movement party to a parliamentary party.

[5] In July 2009, the Budapest Court of Appeal in its final judgement dissolved the Hungarian Guard. According to the judgement, the association had been carrying out its actual activities in abuse of its right to association and its activities had infringed the freedom and rights of the Roma to such an extent as to justify its dissolution.

[6] The Sixty-Four Counties Youth Movement is a revisionist, irredentist, xenophobic and antisemitic organization founded by László Toroczkai in 2001. For more, see Juhász et al. (2017).

[7] The Outlaws's Army is a Hungarian racist, antisemitic organization founded in 2008 by László Toroczkai and Zsolt Tyirityán. For more, see Juhász et al. (2017).

It had to both preserve the far-right radicalism that had helped it get into parliament while also projecting a more moderate, professional, and expert image to appeal to a broader spectrum of voters (Borbáth & Gessler, 2021, p. 84). On the one hand, Jobbik remained active in the extra-parliamentary field even after entering parliament (Pirro & Róna, 2019; Róna, 2016), and its first parliamentary term was characterized by several extreme racist, anti-Gypsy, and antisemitic manifestations.[8] At the same time, Jobbik also displayed the typical moderation associated with parliamentary work in general (Róna, 2006, p. 226), and the party underwent a process of professionalization. Representatives of the party repeatedly said during this period that they would prefer to focus on professional, policy work (Szabó, 2019, pp. 143–144). Jobbik MPs were particularly active in Parliament, and the Jobbik parliamentary group was among the most active ones (Böcskei & Molnár, 2019, p. 6).

The same dichotomy was also identified by Enyedi and Róna (2018), who analyzed the so-called speeches before the orders of the day and the instantaneous questions of party president Gábor Vona between 2010 and 2013. They found that during this period, 'Jobbik's agenda was dominated by law-and-order and Roma issues' and 'in the party president's speeches, conspiracy theories, criticism of Israel and irredentism was only marginally present' (Enyedi & Róna, 2018, p. 258). However, the demonstrations organized by Jobbik and the cover pages of the party-affiliated weekly *Barikád* ('Baricade') presented a completely different picture (Enyedi & Róna, 2018, p. 258).

The attitude of mainstream politicians and a great part of the media towards Jobbik did not change significantly even after it entered parliament. '[M]ainstream politicians tried to pretend that Jobbik did not exist and refused to enter direct debates with the representatives of Jobbik. Many media outlets, especially on the left, refused to interview Jobbik politicians […]' (Enyedi & Róna, 2018, pp. 257–258). Nevertheless, the major political parties notably responded to their political rival. While the Hungarian Socialist Party exhibited fewer but significant changes, the transformation was more pronounced in the case of Fidesz. Since 2010, Fidesz has implemented several stringent law and order measures aligned with Jobbik's 2010 election program and resembling policies typically associated with far-right parties rather than traditional conservative ones (Bíró-Nagy & Boros, 2016, pp. 254–255; Enyedi & Róna, 2018, pp. 259–263). Several factors could explain Fidesz's behavior, one of which is the aftermath of the 2006 riots. Witnessing Jobbik's rapid and radical ascent in popularity, Fidesz may have sought to take preventive measures to ensure that Jobbik could not become a governing force (Enyedi & Róna, 2018, p. 265). The 2014 election campaign clearly indicated that Jobbik aspired to this role.

[8] The most important examples were the following: May 2010: Gábor Vona, then president of Jobbik, took the oath of office in May 2010 at the inaugural session of parliament wearing the vest of the Hungarian Guard, which had been outlawed by then. (This vest was part of the uniform of the Hungarian Guard and was reminiscent of those used by Hungary's pro-Nazi groups of the 1940s.); June 2011: Balázs Lenhardt expressed satisfaction at the relegation of the traditionally Jewish-supported Hungarian football team, MTK, from the league, stating that MTK is a foreign body in Hungarian football; July 2011: Előd Novák accused one of the state secretaries of bias because of his Jewish origin during a debate in Parliament; April 2012: Zsolt Baráth brought up the 1882 Tiszaeszlár blood libel accusations; November 2012: Márton Gyöngyösi called on the government to assess how many Hungarian-Israeli dual citizens of Jewish descent are in the government and parliament, because they, according to him, pose a national security risk; May 2013: Tamás Gaudi Nagy questioned whether everything related to a Holocaust exhibition was entirely in line with the historical facts (Róna, 2016, pp. 40, 50–51).

2.3 Rebranding Jobbik: from a far-right radical party to a people's party

Jobbik had to radically change its image and political message in order to have a realistic chance of winning the keys to the government in the 2014 elections. They needed to appeal to a much broader segment of the population and convince voters that they were capable of governing (Bíró-Nagy & Boros, 2016, pp. 245–246). This transformation started in the autumn of 2013, with the 2014 election campaign, which the media and political analysts have dubbed the 'cuteness campaign' *(cukiságkampány)*. This campaign marked a sharp departure from their 2010 campaign. In September 2013, in a speech to the party's parliamentary group, Jobbik president Gábor Vona 'asked his MPs to rid their rhetoric of its radical edge. The party chairman requested [that] Jobbik members [...] distinguish between substantial and formal radicalism. He said the problem was not what they said, but how they said it' (Bíró-Nagy & Boros, 2016, p. 245). The campaign's fundamental aim was to reposition the party in the political market (Bíró-Nagy & Boros, 2016, p. 245). The 2014 Jobbik campaign was notably dominated by positive slogans and messages such as 'The future cannot be stopped' (Bíró-Nagy & Boros, 2016, p. 247). The party's campaign messages were about raising living standards, improving education, and creating jobs. In the campaign, Jobbik used 'colorful billboards looking like Benetton advertisements, and pictures of the party leader Gábor Vona with heart-shaped messages, dogs, and pets' (Krekó & Juhász, 2017, p. 127).

In 2014, among the Jobbik candidates running for parliamentary seats, there was a significant decline in the proportion of radical candidates. This decline was most notable in the reduction in the number of candidates with previous affiliations with far-right organizations and a decrease in visual radicalism (Róna, 2016, pp. 233–234). The latter was consistent with the fact that 'in several statements, Jobbik claimed that moderation pertained only to communication; it stressed that its program had not changed. Jobbik politicians openly noted that though their communication had softened, the essence had remained as radical as previously' (Bíró-Nagy & Boros, 2016, p. 248). Concurrently, there was a substantial increase in professionalization: the party fielded a considerably larger number of candidates with extensive national and local political experience (Róna, 2016, pp. 234–235). The 2014 election results demonstrated that Jobbik's strategy was effective: the party secured 20 per cent of the vote and expanded its voter base by slightly over 160,000 within a span of four years.

The rebranding impacted various levels of the party to varying degrees: it was significantly more pronounced at the top of the party hierarchy, signifying a 'top-down led deradicalization process' (Hyttinen, 2022, p. 424). Róna (2016), analyzing the speeches of Jobbik MPs in Parliament, found that although the tone of Jobbik's parliamentary speeches had already started to moderate somewhat by the autumn of 2013, this moderation accelerated during the party's second parliamentary term. In the early months of 2016, Jobbik submitted legislation that was quite moderate and resembled proposals typically associated with centrist parties (Róna, 2016, p. 226).

2.4 Internal conflicts and fault lines

As mentioned earlier, Jobbik initially viewed the party's new direction more as a communication strategy. In the autumn of 2014, Tamás Sneider, the party's then vice-president, talked to Jobbik activists and members of the Outlaws' Army. A recording of the conversa-

tion was leaked in March 2015. According to this, Sneider, in addition to making various racist and antisemitic statements in line with Jobbik's previous policy, also said what party president Gábor Vona had denied in response to a public question: that there is a strategic alliance between Jobbik and the Outlaw's Army, and that 'they can do what I cannot do in Parliament, I cannot put it that way, because I have to focus on making Jobbik likable and appealing to the ordinary citizen who lacks any sense of national sentiment and get them to vote for us' (Medvegy, 2015).

The Jobbik leadership began to clearly embrace this strategic shift in the spring of 2015. In April 2015, Lajos Rig won Jobbik's first individual mandate in Tapolca in a parliamentary by-election. After the election, Gábor Vona, speaking to journalists, stated that he considered Jobbik a force for changing the government and was determined to carry the 'people's party' process through in the party. Regarding Jobbik's racist manifestations, he talked about 'pruning wild twigs' (Czene, 2015). In his traditional New Year's speech in January 2016, Gábor Vona spoke about the success of the party's strategy of becoming a people's party, and his commitment was made even more evident by the sign on the pulpit reading 'Real People's Party.'[9] The subsequent 'Building Bridges' campaign aimed to bring together a wide range of voters.[10]

The declared process of strategic change was completed with the events of spring 2016. In April 2016, before Jobbik's upcoming congress aimed at leadership renewal, Gábor Vona, utilizing his presidential veto, declared that he would not allow three of the current vice presidents belonging to the party's radical wing, István Apáti, Előd Novák, and István Szávay, to run for the position of vice president in the congress. Additionally, he stated that he would not support Lórántné Hegedűs either.[11] According to the official justification, as the party was preparing for government, they wished to include its successful mayors in the leadership. Apáti and Szávay eventually fell in line with the decision a few days later. However, Novák and Hegedűs participated as candidates in the nomination process, and nearly half of the Jobbik local branches supported them.[12]

The stakes at the congress were whether Vona Gábor could rally the party behind him or if a party split would occur. In May 2016, at the party congress, Gábor Vona was elected party president, and it seemed that the party was aligning behind him.[13] The party's vice-presidents were those the president wanted: the former vice-presidents (Tamás Sneider, János Volner, and Dániel Z. Kárpát) were joined by three Jobbik mayors, Erik Fülöp, Dávid Janiczák, and László Toroczkai. The congress essentially resulted in the isolation of Előd Novák, the 'party's daredevil' (Róna, 2016, p. 44). The other three stakeholders mentioned above were confirmed in their political capacity by Congress.

Even with these events in the spring of 2016, we cannot interpret them exclusively along the moderate-radical fault line. Róna (2016) points out that 'the three elected mayors are not much more moderate than Előd Novák, but they are more disciplined, and their

[9] See: https://www.youtube.com/watch?v=HPIcGnMoKpQ

[10] See the campaign video here: https://www.youtube.com/watch?v=0QNepAkb1bo

[11] István Apáti, Lórántné Hegedűs and Előd Novák were also Jobbik MPs at that time.

[12] However, according to Jobbik's statutes, even if they had been elected by the congress, they could not have become members of the presidency.

[13] It is important to note, however, that Vona was elected president with about 80 per cent of the candidates voting yes, although he had no other challenger.

personalities do not symbolize uncompromising radicalism, but rather the ability to win and govern' (Róna, 2016, p. 236). Despite Jobbik's support among the total adult population being 14 percent in the spring of 2016, as opposed to Fidesz's 26 per cent,[14] Jobbik's members and leaders genuinely believed that Jobbik could defeat Fidesz in the elections, and they staked everything on this single card. To support this claim, we would like to mention two events. At the congress, Gábor Vona not only clearly stated that Jobbik's goal was to change the government but also announced that if this failed, he would resign as party leader. Another revealing moment was in June 2016, when Jobbik expelled Előd Novák from the parliamentary group and recalled him from parliament. Novák returned his parliamentary mandate, so he was not ultimately expelled from the party. Meanwhile, his wife, MP Dóra Dúró, retained her former position and remained the deputy leader of the Jobbik parliamentary group.

Jobbik won 19 per cent of the votes in the 2018 parliamentary elections. Although it increased its voter turnout by around 75,000 voters compared to 2014, it came second behind the ruling party. Gábor Vona announced his resignation as party president on the night of the election, as he had previously promised. The resignation was quickly followed by events that made the party split inevitable, now clearly along the moderate-radical fault line. Hyttinen suggests that 'Vona's charisma and popularity made it possible to stretch the original ideological borders, but his resignation after the 2018 elections led to an instant split between the two incompatible factions within the party' (Hyttinen, 2022, p. 445).

Besides resigning as party leader, Gábor Vona also did not take up his parliamentary mandate and was replaced by Lajos Rig. One month after the electoral defeat, Jobbik held its next congress, where Tamás Sneider and László Toroczkai competed for the party presidency. The delegates chose Sneider, but the division within the party was unmistakable in the result: Sneider received 298 votes, while Toroczkai received 256. On the one hand, this showed that Jobbik would continue along the 'people's party' line, but on the other hand, signs of the party's split had already emerged. Toroczkai first tried to unite the radical faction within the party, but this led to his expulsion from the party in June 2018. As a result, several members left the party, including Jobbik MPs István Apáti, Dóra Dúró, Erik Fülöp, and János Volner, who formed the not official 'Our Homeland Movement'[15] *(Mi Hazánk Mozgalom)*, founded by Toroczkai and his associates.

In the 2019 European Parliament elections, Jobbik achieved a disappointing result of 6 per cent, leading to the resignation of the party's leadership. The party congress was scheduled for after the October municipal elections, but it was already known in the summer that the party's newly elected faction leader, Péter Jakab, was considering running for the position of party president. Overall, in the municipal elections, Jobbik performed better than in the EP elections, but its results were far below those of the 2018 general elec-

[14] Source: https://www.zaveczresearch.hu/stabil-parteroviszonyok/

[15] The Our Homeland Movement is a far-right party founded by László Toroczkai in 2018 after he left Jobbik. Among the party's founding members are several former Jobbik MPs, including István Apáti, Dóra Dúró, Előd Novák, János Volner, and Gábor Ferenczi. (The latter two left the Our Homeland Movement in 2019.) The party stood in the 2019 European Parliamentary elections, where it did not win a seat. However, in the 2022 Hungarian parliamentary elections, the party achieved 6 percent of the vote and was able to send six MPs to Parliament.

tion. Additionally, opposition parties believed that their only chance of victory was to field joint candidates given the significant alterations to the electoral system carried out by Fidesz, the considerable influence of Fidesz-controlled media, and Fidesz's overwhelming popularity. This meant that Jobbik had to form alliances with parties, particularly the Democratic Coalition led by Ferenc Gyurcsány, with which it had previously been in disagreement and which some of its membership already found almost impossible to digest.

In November 2019, the Congress was due to take place. Peter Jakab, whom most party members wanted as their president, however, attached conditions to his candidacy. One of them was that he wanted to decide on the vice president. The party's national electoral committee did not support this, so Jakab withdrew his candidacy, and, as he was the only candidate, the congress was postponed to January. At the end of 2019 and the beginning of 2020, two groups fought to control Jobbik: Péter Jakab's and István Szávay's circles. The latter group presumably consisted of the following individuals: Tibor Bana, János Bencsik, Anett Burik, Csaba Gyüre, János Stummer, and Andrea Varga-Damm, all of whom, except for Burik, were Jobbik MPs. It is also important to point out that Szávay had to resign his mandate in January 2019 because it was revealed that he had made severely antisemitic statements in a leaked private conversation.

In January 2020, the Jobbik congress was finally held, where Péter Jakab was elected as president with 88 percent of the votes. His preferred candidates for vice presidents (Balázs Ander, Róbert Dudás, György László Lukács, Anita Kőrősi Potocskáné, György Szilágyi, and Dániel Kárpát Z.) were also elected. In February 2020, a recording of Jakab's speech before the closed-door congress was leaked. In the speech, Jakab criticized the outgoing presidency (Tibor Bana, Csaba Gyüre, János Stummer, Gábor Szabó, Tamás Sneider). He also mentioned the 'Szávay clan' and personally named the people he did not want to work with. In February 2020, István Szávay left the party, as did Tibor Bana, János Bencsik, Gergely Farkas, and Tamás Sneider, who were among the party's MPs. In addition, Andrea Varga-Damm was expelled from the party. And we must also mention one other person who left the party, Ádám Mirkóczki, who had been a member of Jobbik since 2008 and was a member of parliament and spokesperson of the party between 2010 and 2018.

3 Data and methods

3.1 Analyzed corpus

The name of the corpus used for our research is PARLDATA, which contains speeches from the National Assembly of Hungary. The data was collected from the official website of the Hungarian Parliament by the non-profit organization K-Monitor, its volunteer developers, and Precognox. The database contains parliamentary speeches collected from 1998 to 2020 and metadata related to each speech, such as information about the speech (e.g., type and date, the actual parliamentary session in which the speech was held), and details of the speaker (e.g., name and party affiliation). In our research, we focused on speeches given between 2010 and 2020; the relevant corpus contains 385,880 parliamentary speeches of different types. The analyzed corpus is part of the ELTE RC2S2 research project The layers of political public sphere in Hungary (2001–2020) supported by the

NKFIH (National Research, Development and Innovation Office). For the research, we applied conventional preprocessing steps and cleaned and filtered the PARLDATA corpus according to the purpose of the analysis. Based on the 'type of speech' metavariable, we removed ceremonial and order of business speeches that, from a substantive point of view, are not relevant to the current investigation and do not contribute to the political message of the speaker. Furthermore, we corrected the party affiliation of the speakers (if necessary) and targeted only party-affiliated politicians to enable the selection of members of Jobbik. We also deleted speeches that were too short (less than five words long) and texts that did not pertain to the speeches (e.g., the name of the speaker and opening addresses at the beginning of the speech). The resulting corpus consists of 170 298 speeches, 17 335 of which were given by politicians of Jobbik. We also removed the punctuation and capitalization of words and deleted special characters and URLs from the raw texts. After these data cleaning and filtering steps, we used the e-magyar text processing system (emtsv, Váradi et al., 2018) to unify the various forms of the same words.

Parliamentary speeches represent the core and official narratives of political parties and their individual representatives. As these texts are assigned to individual speakers, researchers gain information not only about each party member separately but – by examining the relationship between the parliamentary speeches – also about the hierarchies of parliamentary parties and the power dynamics among their representatives.[16]

3.2 Methods

For our analysis, we applied a series of natural language processing (NLP) tools. First, we constructed the document representation of the corpus, embedding the speeches in an abstract vector space in which the relationships between speeches and party representatives could be mapped. Second, we built a network based on the similarities of speeches in the document embedding space for each political term. Third, by considering the time dimension, we generated the networks of party members for each term based on their parliamentary speeches, which we analyzed using social network analysis. Finally, we used structural topic modeling to identify the topics of each parliamentary term and the evolution of these over time.

We used Word Mover's Embedding in the first phase of our analysis. For calculating the document distance (Wu et al., 2018a), Word Mover's Distance (Kusner et al., 2015) was computed, which measures the similarity of two documents in the word-embedding space and we used the distances to kernels and embeddings (Wu et al., 2018b), which is a procedure typically used to obtain a vector representation of documents.

To construct a network of Jobbik politicians, we followed the steps described in this section. First, we aggregated the document vectors. The unit of analysis was politician and parliamentary term (a four-year period for each member of parliament). In other words, the document vectors coding the linguistic characteristics of the speeches for the defined unit were aggregated (averaged) in each parliamentary term. Second, we created a net-

[16] As mentioned before, our paper is not the first to include an analysis of Jobbik MPs parliamentary speeches. See for example: Róna (2016), Enyedi & Róna (2018).

work of Jobbik representatives per parliamentary term. If two politicians' speeches were more similar than a predefined threshold, an edge was constructed in the graph between them. Third, we applied the cluster walktrap process (Pons & Latapy, 2005), a clustering procedure built upon random walk and undertook social network analysis to compute the basic characteristics of the graph. By generating the network of Jobbik politicians for the different parliamentary terms, we were able to observe the temporal dynamics within the parliamentary party representatives. We computed basic features of the social networks (Scott & Carrington, 2011) to learn more about the general structure of Jobbik and the relationship between the parliamentary members of the party in each term.

To obtain information about the substantive content of the speeches, we applied topic modeling. In general, this is a commonly used approach in the social sciences that allows researchers to approach a problem not only in a quantitative way but also to complement that perspective with qualitative analytical methods and interpret the results accordingly. The basic concept of topic modeling is built on 'bags of words' models that exclude the information derived from the syntactic relations of words in texts and the word order within sentences.

Various topic modeling techniques exist that differ in their statistical assumptions; our approach employed structural topic models (Roberts et al., 2013), which include a between-topic correlation structure and enable the integration of document metadata that impacts topic variation across documents. We utilized the STM package in R (Roberts et al., 2019) for building structural topic models – a method for revealing latent themes within a corpus while taking into consideration – in our case – time as a continuous explanatory variable. This generative statistical model characterizes a topic as a distribution over terms and a document as a distribution over topics.

We used the parliamentary speeches of Jobbik party representatives and built STMs. To address this issue of identifying the optimal topic number, we adopted a mixed-methods approach; we evaluated the interpretability of our models by computing topic coherence scores, which measure the semantic similarity between the most significant words in each topic, and to complement that approach, we interpreted the topics substantively. The latter was more dominant during the evaluation process. Since STM is unsupervised, the researcher is responsible for understanding the substantive content of the topics. In our analysis, we relied on the most pertinent terms to interpret the topics, and according to the qualitative interpretation of the various model outputs, we selected a structural topic model with seven topics.

4 Results

4.1 Network of Jobbik politicians

We examined Jobbik's social network, constructed according to the similarity of the speeches of the party representatives for each parliamentary term, 2010–2014, 2014–2018, and 2018–2020 (half term). In the following, we demonstrate the results according to the visualization of the social networks. The figures (Figures 1–3) show the politicians (vertices of the graph) and their connections (edges of the graph) based on the similarity of the speeches of the politicians of the given time periods. According to these visualizations, the party coherence and dynamics can be observed.

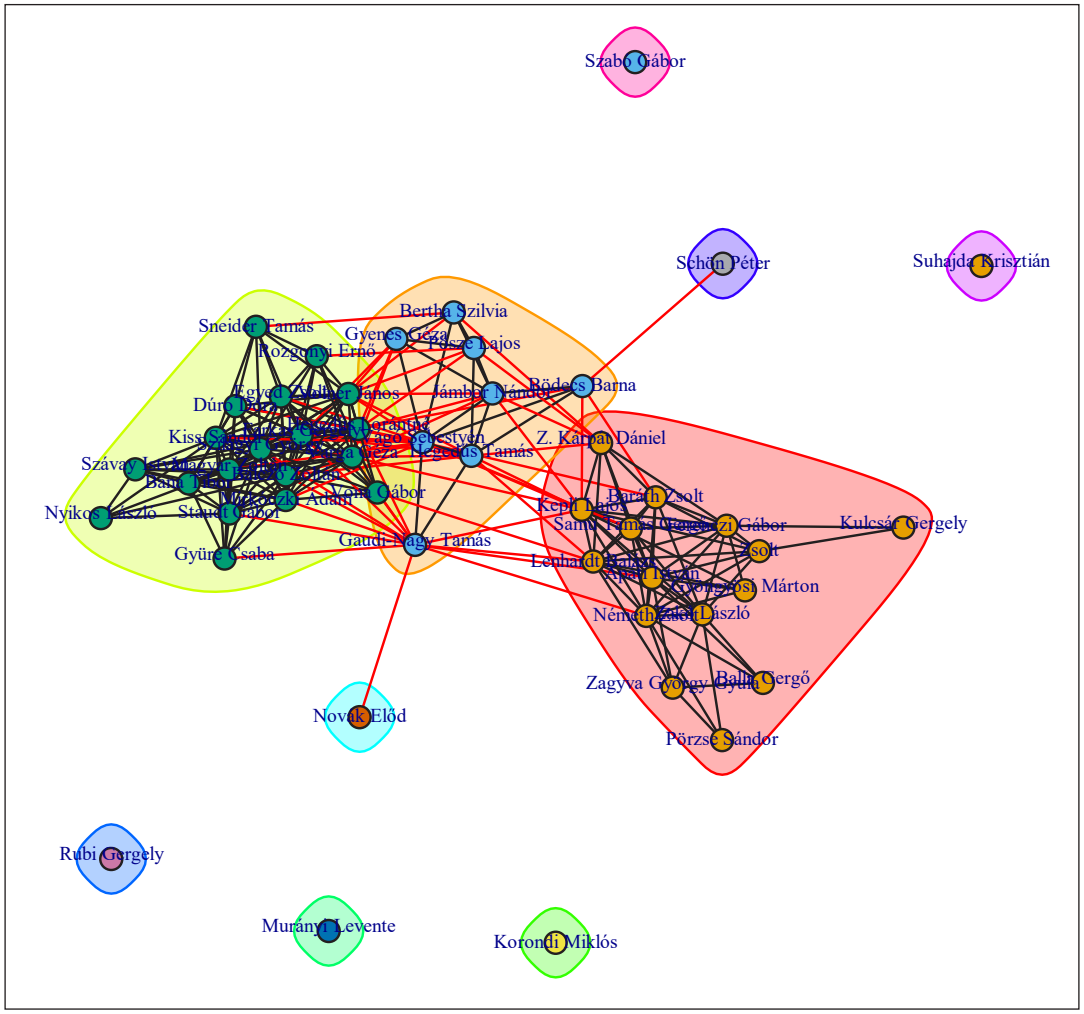

Figure 1 Network of parliamentary party Jobbik between 2010 and 2014

Figure 1 shows how ten clusters were generated based on the similarity of the speeches of Jobbik representatives for the first parliamentary period. Seven politicians stand alone in one-person clusters, namely Gergely Rubi, Krisztián Suhajda, Miklós Korondi, Gábor Szabó, Levente Murányi, Péter Schön, and Előd Novák, according to their parliamentary speeches within the examined period – these are the representatives of Jobbik whose speech is not that similar to other members of the party. Besides the seven one-person clusters, there are three other densely populated clusters. The first one (light red) contains fifteen, the second (light orange) eight, and the third (light yellow) nineteen party representatives. The light red group links politicians like Dániel Z. Kárpát, Zsolt Barát, István Apáti, Gyula György Zagyva, and the light orange one contains members like Sebestyén Vágó, Lajos Pősze, Tamás Hegedűs, and Tamás Gaudi-Nagy. Vona Gábor is involved in both the light orange and the yellow groups and seems to be an important link between them. The light-yellow cluster contains politicians like János Volner, Gábor Staudt, Zoltán Magyar, and István Szávay. For further information, see Figure 1.

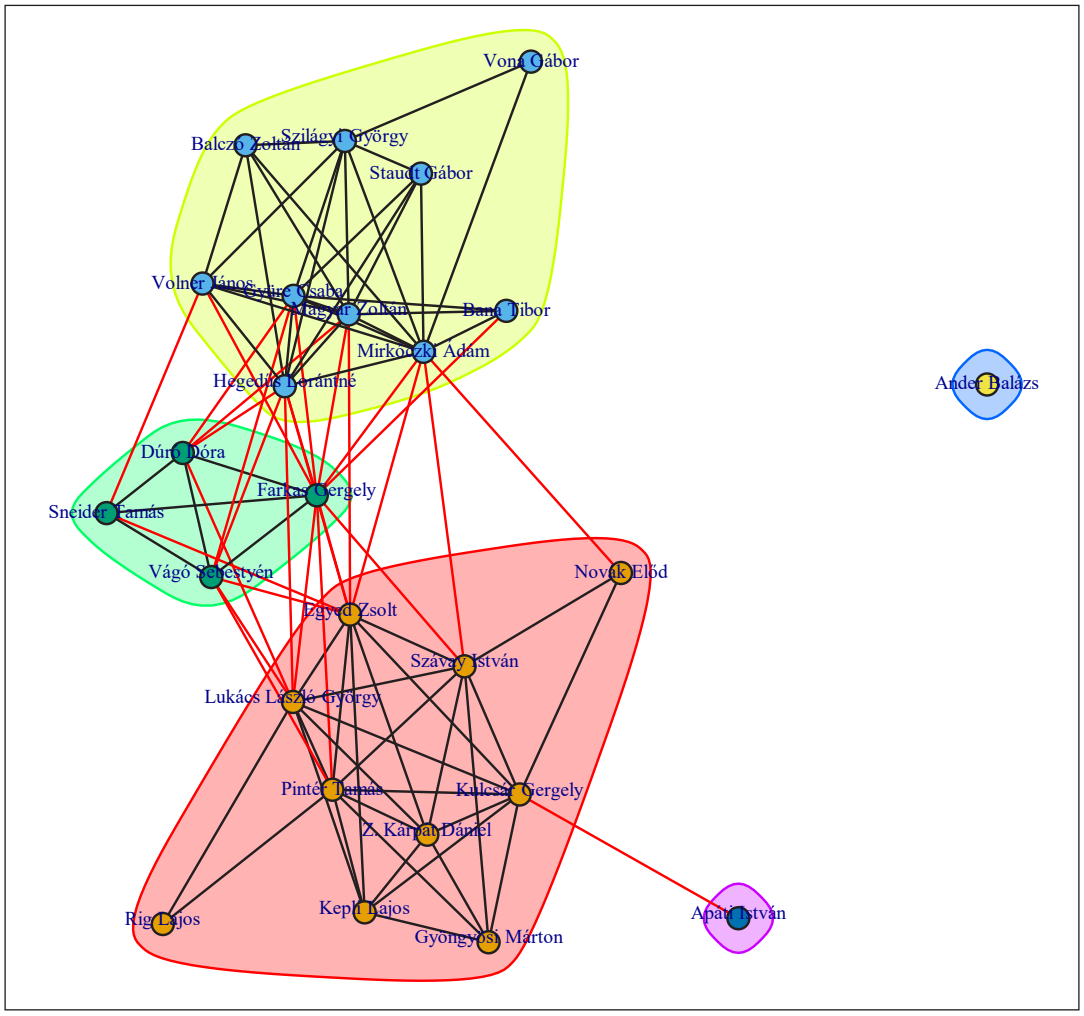

Figure 2 Network of parliamentary party Jobbik between 2014 and 2018

As summarized in Figure 2, there are five clusters of Jobbik party representatives for the second parliamentary period. According to the similarities of the speeches, there are two politicians, István Apáti and Balázs Ander, who stand alone in a cluster; they do not speak similarly to other members of the party, Jobbik. There are two bigger and densely connected clusters and a smaller one. To the latter cluster (colored light green) belong only four politicians, namely Dóra Dúró, Gergely Farkas, Sebestyén Vágó, and Tamás Sneider. The other two clusters are equally populated; they contain ten party representatives. One of them (colored light red) groups politicians like Előd Novák, Dániel Z. Kárpát, Márton Gyöngyösi, Tamás Pintér, while the other (colored light yellow) links members like Gábor Vona, Zoltán Magyar, János Volner, Gábor Staudt, although the lists are not exhaustive (for further details, see Figure 2).

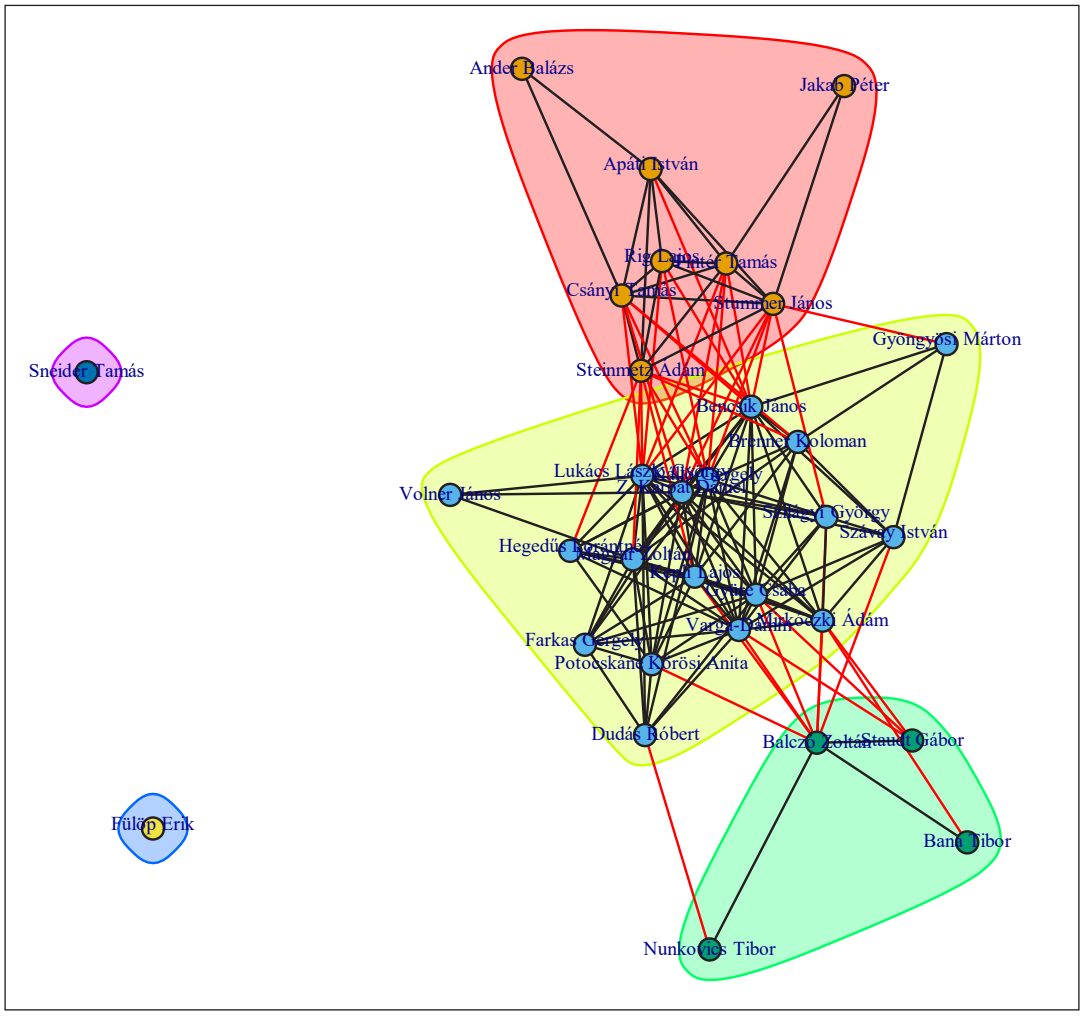

Figure 3 Network of the parliamentary party Jobbik between 2018 and 2020

Based on Figure 3, within the last examined period, there are again five clusters of party representatives for Jobbik. Tamás Sneider and Erik Fülöp stand alone in one-person clusters, while the rest of the members of the party are grouped in three bigger clusters. The smallest group (colored light green) contains four politicians: Zoltán Balczó, Gábor Staudt, Tibor Bana, and Tibor Nunkovics. Another cluster (light red) links eight people together (for example, Péter Jakab, Tamás Pintér, István Apáti, and Balázs Ander), while the third cluster groups politicians like Isván Szávay, János Volner, Róbert Dudás, and Andrea Varga-Damm, etc. For further details, see Figure 3.

We computed some of the basic features of the graphs to examine the differences between the targeted parliamentary terms. A summary of these can be found below in Table 1.

Table 1 Features of the network for the parliamentary terms

Features of networks	**Parliamentary terms**		
	2010–2014	**2014–2018**	**2018–2022 (half term)**
Number of vertices	49	26	32
Number of edges	247	93	152
Number of clusters	10	5	5
Density	0.21	0.29	0.31
Diameter	4.53	3.65	3.65
Average distance	1.97	1.77	1.68
Average number of degrees	10.08	7.15	9.50
Transitivity	0.63	0.57	0.62

Major changes were introduced to the parliamentary system after 2010 by the governing party coalition, Fidesz-KDNP (Fidesz – Hungarian Civic Alliance and Christian Democratic People's Party), which is led by the current Hungarian Prime Minister Viktor Orbán. The effect of this was that the number of party representatives in the Hungarian Parliament increased. Therefore, it is more informative to study the number of vertices (the politicians of Jobbik in the parliament) for each period only if one keeps in mind the general changes that took place.

As Table 1 summarizes, the number of edges refers to the number of speeches that are more similar to each other than a predefined measure. Observing the number of edges, it is obvious that the various parliamentary periods were different according to the similarity of the speeches. For the last (half) term, the number of edges is relatively high compared to the previous one. Density increased, which means that, in general, homogenization took place within the language of Jobbik, according to the parliamentary speeches. The diameter of the graphs decreased, not independently of the decrease in the number of people involved in the analysis; for the last two parliamentary terms, the measure is equal. The average distance decreased as well, from the first-term measure of 1.97 to 1.77 and 1.68. Observing the average number of degrees, we can see that in the second parliamentary term (2014–2018), the speeches were less similar to each other, but the decreasing tendency between 2010–2014 and 2014–2018 was reversed, and in the period 2018–2020 the average number of degrees became higher again, indicating that more speeches were similar to each other among party members of Jobbik. The transitivity measure is relatively high compared to other parties for each parliamentary term.

4.2 Dominant topics in parliamentary terms

As described in the 'Methods' section, we applied structural topic modeling to examine the substantive content of parliamentary speeches by Jobbik members over time. According to the evaluation process, we selected a topic model with seven topics. The interpretation of the topics and ten corresponding keywords associated with the various topics are shown in the table below.

Table 2 Topics and ten dominant words for each in the examined period (2010–2020)

Topic	**Keywords**
Topic 1: Social issues	pension system, public burdening, family home creation benefit, labor market, home creation, credit impaired people, National Asset Management, Hungarian Bank Association, eviction moratorium, family allowance
Topic 2: National politics	Miklós Horthy, 1945, anti-Hungarian, patriotism, finnugor, nazi, army, György Mátsik, memorial, fascist
Topic 3: Electoral law	recommendation slip, house rules, electoral law, constitution, candidate, National Election Committee, vote, mandate, constitutionality, electoral system
Topic 4: Corruption	Balaton, community transport, contracting, the Municipality of Budapest, contracting authority, world heritage, Hungarian State Railways, public procurement, tourism, National Land Fund Management Organization
Topic 5: Sports	Hungarian Olympic Committee, corporate tax, sports, Olympic, stadium, sports federation, Ferenc Puskás, football, athlete, sports facility
Topic 6: Policies	GMO, carbon dioxide, renewable energy, climate change, nuclear, electricity, free trade, Transatlantic Trade and Investment Partnership, energy strategy, EU-Canada Trade Agreement
Topic 7: Legal system	judicial, judge, National Court Office, lawyer, Civil Code, Misdemeanor Law, civil proceedings, victim, Criminal Law, imprisonment

Besides the interpretation of the topics and the study of the most important words assigned to each topic, we examined the dynamics of topic dominance over time. The following table shows the proportion of each topic for the years between 2010 and 2020. The color scale ranges between blue (lower values) and red (higher values), highlighting the dominance of each topic relative to their presence for different years.

Table 3 Topics and topic dominance for each year in the examined period

Year	Topic 1: Social issues	Topic 2: National politics	Topic 3: Electoral law	Topic 4: Corruption	Topic 5: Sports	Topic 6: Policies	Topic 7: Legal system
2010	10,4%	13,7%	26,9%	8,2%	17,8%	7,8%	15,1%
2011	13,6%	13,3%	23,6%	7,9%	19,6%	6,7%	15,3%
2012	12,9%	12,4%	20,4%	10,3%	18,8%	9,8%	15,4%
2013	13,3%	10,5%	17,9%	11,2%	20,2%	9,2%	17,7%
2014	18,4%	9,5%	14,6%	11,1%	19,7%	13,9%	12,8%
2015	16,9%	10,4%	10,9%	13,4%	18,5%	16,6%	13,4%
2016	18,2%	10,8%	10,8%	13,7%	20,0%	15,3%	11,2%
2017	20,1%	11,0%	7,4%	12,1%	22,4%	15,8%	11,3%
2018	21,6%	11,8%	9,2%	8,7%	23,8%	13,6%	11,3%
2019	24,0%	12,4%	8,5%	7,8%	24,5%	14,7%	8,0%
2020	20,2%	9,7%	8,1%	10,2%	27,5%	15,1%	9,1%

As demonstrated by Table 3, in 2010, the most prominent theme discussed by Jobbik politicians in the parliament was the new electoral law. The proportion of that topic within the given year's speeches was 26.9 per cent. The second most discussed theme was sports (17.8 per cent), while the third was the legal system (15.1 per cent). Although the proportions changed slightly, the patterns were the same in 2011 and 2012. In 2011, the proportions of the electoral law, sports, and legal system topics were 23.6, 19.6, and 15.3 per cent, while in 2012, they were 20.4, 18.8, and 15.4 per cent, respectively. From 2013 onwards, the topic of sports became the most popular among Jobbik's party representatives. The dominance of the topic for each year is visible from the results; the proportions of the topic were 20.2, 19.7, 18.5, 20.0, 22.4, 23.8, 24.5, and 27.5 per cent between 2013 and 2020, respectively. In 2013, the second most popular topic was electoral law (17.9 per cent), and from 2014, social issues were second in line, with proportions of 18.4, 16.9, 18.2, 20.1, 21.6, 24.0, and 20.2 per cent each year between 2014 and 2020.

As shown in Table 3 through the colors of the values, Topic 1 (Social Issues) was dominant relative to its presence between 2017–2020, while Topic 2 (National Politics) was more dominant between 2010–2012 and 2018–2019. Topic 3 (Electoral Law) was intensively discussed between 2010–2014, while Topic 4 (Corruption) between 2013–2017. The theme of Sports (Topic 5) had a higher peak between 2017 and 2020 than its own average values, and from 2017 the topic became more dominant in each year (see relatively larger proportions compared to other topics). Topic 6 (Policies) was more dominant between 2015–2017 and 2019–2020 relative to its average value, while Topic 7 (Legal System) between 2010–2013.

5 Discussion

It is immediately apparent, looking at Figure 1, which shows the 2010–2014 parliamentary term network, that the three clusters containing most of the MPs are very dense. The average degree of the graph is 10.08, which is not much less than in the graphs of the other two terms, even though the number of MPs in those is fewer. Gábor Vona, the president of the party, is highly embedded in the network, and his speeches share similarities with those of his peers in the other clusters. Among the vice presidents that reigned during this period, István Apáti, Zoltán Balczó, Csaba Gyüre, Előd Novák, Tamás Sneider, and János Volner were also MPs. All of them were very active in parliament: even Tamás Sneider, the least active, made 153 speeches. Apáti, Balczó, and Volner have an especially high number of connections, which means their speeches have similar patterns to many of the other MPs. The latter two connect to those in the other clusters, while Apáti is only linked to Tamás Gaudi-Nagy, the central figure in one of the adjacent clusters. It is worth noting that with 990 speeches, Gaudi-Nagy is the Jobbik MP who spoke most frequently in this parliamentary term. Of all the vice presidents, Előd Novák's position is the most interesting: He was one of the most active MPs in Jobbik in the 2010–2014 term.[17] Our analysis shows that he has a unique speech style that does not resemble that of any of his party peers. One may assume that the subsequent ousting of Előd Novák from the party is not unrelated to this. Like Novák, Péter Schön's speeches are similar to those of only one of his fellow MPs (Barna Bödecs). It is important to note, however, that Péter Schön was a Jobbik MP who made very few speeches: he spoke only 21 times in parliament, compared to the average of 213 by Jobbik's MPs. It is also worth looking at those MPs who form a cluster on their own and whose speeches do not resemble those of any of their fellow MPs. Of these, Miklós Korondi has made the most speeches (115), but even this is below average for Jobbik. The others, however, are by any measure inactive members of the parliamentary chamber, with around 20 or fewer speeches.

The graph showing the network of the 2014–2018 parliamentary term (Figure 2) clearly shows that not only has the number of clusters decreased, as shown in Table 1, but also the number of individual MPs. This may be partly due to the fact that fewer MPs won seats in this term, with only 26 MPs from Jobbik compared to 49 in the previous term. It is important to point out, however, that the drastic reduction in the number of clusters was not accompanied by a significant increase in density (0.29 in this term compared to 0.21 in the previous one). Starting the individual-level analysis with the party leader Gábor Vona, it is obvious, even by looking at his speeches, that his position has changed significantly. In Jobbik's first parliamentary term, his speeches were similar to those of many of his fellow MPs, whether they were members of his own cluster in the network or other clusters. In the 2014–2018 term, however, he became isolated. There were only two MPs in the parliamentary group, Ádám Mirkóczki and György Szilágyi, who spoke in a similar way and who were all members of the same cluster. It is worth noting that Mirkóczki was the spokesman of the party at the time, so it is understandable that his speeches were similar to those of the president of the party he represented. György Szilágyi previously served as

[17] He was the second most active politician with 720 speeches in the 2010–2014 parliamentary term.

Vona's chief of staff and came into the spotlight in 2020 when he became vice-president of Péter Jakab, who also supported the people's party strategy and replaced Vona as president of Jobbik.

The 2014–2018 parliamentary term, as described earlier, brought great changes in the life of Jobbik: the party clearly chose to continue the people's party strategy and chose Gábor Vona to lead this process. The party president withdrew his confidence from three of the party's former vice-presidents, István Apáti, Előd Novák, and István Szávay. With Apáti, we saw that, unlike in the previous term, he was very 'out of line' here. Előd Novák's speeches[18] between 2014 and 2016 were similar to those of many of his colleagues, but the change was not dramatic. Let us recall, however, that Novák formed a separate cluster in the previous term. István Szávay occupied a much more central position than the other two vice presidents: he spoke like many MPs (one of his connections was Előd Novák), and these similarities also show up as between-cluster ties. Let us also look at the situation of Lorántné Hegedűs in this context, who was not supported by Vona in her candidacy for vice president. Hegedűs was one of the more active MPs in Jobbik's first and second terms, and her speeches were similar to those of many of her fellow MPs. In her case, this may be the reason why, as we wrote earlier, half of Jobbik's local branches supported her candidacy for vice president.[19] The speeches of the vice president whom Vona voted for (Tamás Sneider, János Volner, and Dániel Z. Kárpát) had many similarities with those of other party MPs.

The next parliamentary term started with even more turbulent processes. Jobbik failed to win the elections, so the change of government that the party had staked everything on, which probably held together the increasingly fractious forces of the party, at least on the surface, did not materialize. Gábor Vona resigned as party president, and the congress elected Tamás Sneider, who represented the continuation of Vona's line, as president against László Toroczkai, a staunch supporter of the radical line.[20] The events led to a party split. Dóra Dúró left the parliamentary group in May 2018 and is therefore not included in Figure 3. In her case, it is worth noting that her speeches during the previous two terms were very similar to those of her fellow MPs in Jobbik. In the first term, her degree number (number of connected politicians in the graph) was above average for Jobbik (13 versus 10.08); in the second term, it was still around the average (7 versus 7.15). The latter figure is certainly high, considering that her husband, Előd Novák, was expelled from the party during this period. István Apáti, Erik Fülöp, and János Volner joined the Our Homeland Movement in October. Among them, István Apáti's speeches were relatively similar to those of other MPs, and this is worth evaluating in light of the fact that he was much more isolated in the previous term between 2014 and 2018. The similarity of János Volner's speeches to those of other Jobbik MPs decreased considerably over time. In the case of Erik Fülöp, the graph shows complete isolation, but this is probably because he only addressed the Parliament six times.

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[18] Előd Novák's mandate ended on 31 August 2016.

[19] This was also the case with Előd Novák, but there we can assume that his speeches were addressed to those who did not agree with the process of the deradicalisation of Jobbik.

[20] It is worth noting that Sneider is associated with a completely separate cluster, but the fact that he had a total of eight speeches in Parliament plays a big role in this.

Finally, let us look at the events of 2019–2020. In 2020, after some wrangling, the party elected Péter Jakab, who was then the party's parliamentary leader, as also its president. He spoke often, but Figure 3 shows that his speeches were unique. Jakab then identified the 'Szávay clan' as his main opponent. All of the people mentioned by name were MPs except Anett Burik. It is important to note that all of them, except for Tibor Bana (János Bencsik, Anett Burik, Csaba Gyüre, János Stummer, and Andrea Varga-Damm), were among the MPs who shared connections to many others and bridged clusters in the network. It should be added that this also applies to István Szávay, the assumed informal leader of the group, who left the parliamentary group in January 2019, as mentioned earlier. It seems, therefore, that with their departure, the central figures of the network based on the speeches of Jobbik's MPs had left.

Let us also look at the MPs who appeared alongside Péter Jakab: Balázs Ander, Róbert Dudás, László György Lukács, Anita Potocskáné Körösi, and György Szilágyi.[21] Ander, Lukács, and Potocskáné gave many speeches, but there was a significant difference in their similarity. While Balázs Ander's speech style is unique (he formed a cluster on his own in the previous term), the speeches of the other two representatives show a high degree of similarity. Szilágyi spoke less than Potocskáné, but their edge degrees are similar. Dudás, on the other hand, spoke less but in a similar way to many other MPs.

The results of the structural topical model clearly show that the topics of Jobbik MPs' contributions changed significantly between 2010 and 2020. The first term was dominated by topics related to national politics, electoral law, and the legal system. For the latter two, this was the case for the whole term and even somewhat carried over to the next term. However, issues related to national politics had already decreased in importance by the end of Jobbik's first term in Parliament. The results of the topic modeling also show that Jobbik was turning to other issues in the second parliamentary term: corruption and global policies were at the center of their parliamentary speeches. In the second half of their second parliamentary term, social issues and sports became important. However, it is clear from the words most commonly used in each topic that criticism of Fidesz policies is most often related to these topics. These themes persisted in the last term of the studied period, with the exception of corruption. Also, the topics of national politics returned at the beginning of the term.

6 Summary

In our paper, we describe an analysis of the parliamentary speeches delivered by Jobbik MPs between 2010 and 2020. Our study focused on both the content of these speeches and the networks that formed among politicians within each parliamentary term based on the similarity of their speeches. During this period, Jobbik underwent significant transformation. In 2010, it became a parliamentary party, and from late 2013 onwards, it embarked on a transformation process with the goal of becoming a 'real people's party.' This transformation process was marked by numerous internal conflicts and divisions within the party,

[21] Of the former vice-presidents, only Z. Dániel Kárpáti remains.

eventually leading to a split, resulting in the departure of many members. It is worth noting that these conflicts remained concealed for a considerable time as the party maintained its unity in pursuit of winning elections and gaining access to government positions. These dynamics became evident through our network analysis based on the similarity of parliamentary speeches. With Gábor Vona's resignation in 2018, the party lost a charismatic leader who had held the party together. Network analysis clearly shows the difference between Vona and the party's later presidents. Our analysis of the topics covered in parliamentary speeches clearly reflects the trends described in the literature. The main themes of each parliamentary term and the dynamics of these themes demonstrated the process of professionalization that Jobbik aimed to achieve based on its objectives.

The metamorphosis of Jobbik involved not merely a shift in ideology but also a strategic rebranding effort influenced by both internal and external factors. Internally, Jobbik faced the challenge of broadening its appeal beyond its traditional base of far-right supporters. This necessitated a recalibration of its political rhetoric and policy priorities to attract moderate voters who were disillusioned with the established parties. Externally, the changing political landscape in Hungary, marked by the dominance of Fidesz and the fragmentation of the left, provided Jobbik with an opportunity to reposition itself as a viable alternative. Jobbik's strategic communication involved a conscious effort to soften its image, distancing itself from previously held extremist positions and adopting a more inclusive and socially acceptable discourse. This rebranding was evident in its emphasis on issues like corruption and social issues, which resonated with a broader electorate.

The power dynamics within the Hungarian political sphere also significantly influenced Jobbik's journey. As Fidesz consolidated its power, the political space for opposition parties became increasingly constrained, compelling Jobbik to adapt its strategy. The party's shift towards the center can be seen as a pragmatic response to the hegemonic position of Fidesz, aimed at carving out a sustainable niche in the competitive political environment. Additionally, the interactions between Jobbik and other opposition parties, including potential coalitions and electoral strategies, underscored the complex dynamics of power and alliance-building in Hungarian politics.

In conclusion, Jobbik's evolution from a radical right-wing party to a mainstream political force is a multifaceted process that underscores the importance of political communication and power dynamics. By rebranding itself and adapting to the changing political context, Jobbik's shift demonstrates the fluidity of political identities and the strategic calculations that underpin party transformation.

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Levelling up quantitative legislative studies on Central-Eastern Europe: Introducing the ParlText CEE Database of Speeches, Bills, and Laws

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Abstract

The availability of ready-made textual corpora for research is crucial for social scientists, especially in the current era of rapid advancements in natural language processing (NLP) and artificial intelligence (AI) methods. Despite various useful contributions that address issues of accessibility and standardisation when it comes to such corpora, in many cases, they have limitations related to scope, geographical coverage, and time frame. This concern is particularly significant in the context of political research on Central-Eastern Europe (CEE), for which such deployment-ready databases are few and far between. In this research note, we bridge part of this gap by making available a new database: ParlText CEE. The database, prepared under the auspices of the V-Shift Momentum project at the HUN-REN Centre for Social Sciences, covers almost 1.9 million text vectors and metadata for parliamentary speeches, bills, and laws for Czechia, Hungary, Poland, and Slovakia for the period from 1990–1991 to 2022–2024. The datasets encompass relevant dates, texts, titles, and, in the case of the speech corpora, parliamentary agendas, speaker names, and parties. All data are also linked based on unique identifiers following the ParlLawSpeech standard. This paper introduces the specifics of the 1.0 release of ParlText CEE and contemplates its possible use cases.

Keywords: Central-Eastern Europe; legislative studies; legislative database; parliamentary speeches; bills and laws

1 Introduction

The rapid emergence of text-as-data approaches and natural language processing methods (NLP) in the 2010s opened up vast new opportunities for political research in general and quantitative legislative studies in particular (Grimmer & Stewart, 2013; Brady, 2019; Slapin & Porksch, 2014). The most significant requirement of conducting quantitative text analysis is finding relevant and directly usable corpora associated with adequate metadata (such as the socio-economic background of members of parliament (MPs) who make speeches, see Grossman & Pedahzur, 2020, p. 254). Quantitative legislative studies can utilise such databases of political debates (Bächtiger, 2014) and legal documents (Martin & Vanberg,

2014, p. 439), including bills (draft laws) and adopted laws. Using these data with NLP methods can help reveal the still hidden patterns and characteristics of political behaviour and governance and extend – still prevalent – single-country research designs to various jurisdictions and languages in a comparative manner.

There are many precursors in the form of projects aimed at creating structured datasets on legislatures for the Central-Eastern European (CEE) region. Among others, the ParlSpeech (Rauh & Schwalbach, 2020) and ParlLawSpeech (Proksch et al., 2024) datasets, the Comparative Agendas Project (Baumgartner et al., 2019), and the ParlEE database (Sylvester et al., 2024) are notable examples of such contributions. In all cases, they cover at least one of the so-called Visegrád countries (Czechia, Hungary, Poland, and Slovakia, which we use as a synonym for CEE). These datasets mainly contain information on legislative speeches, but the Comparative Agendas project also collected information, for example, on legislative documents (bills and laws). Except for the Comparative Agendas Project, they mainly focus on recent decades.

Despite various useful contributions and existing datasets that address issues of accessibility and standardisation, they tend to have several limitations in terms of the scope of metadata, geographical coverage, and timeframe. This concern is particularly significant in the context of political research on CEE, for which such deployment-ready databases are few and far between. Although the region's countries are generally regarded as a mostly homogenous group, they are, in practice, different from each other in several critical respects (Wolchik & Curry, 2018). Differences arise if we focus on, e.g. their social diversity, party systems, institutional settings, or the relevant actor types of policy-making. Databases are crucial tools that permit access to valid inferences for such comparative research questions.

Besides the limited scope and disjointed nature of legislative datasets on CEE, the other main problem of quantitative researchers is data accessibility. Although legislative archives are publicly available for CEE countries, at least for the period starting with the democratic transition of 1990, they are often difficult for data scientists to navigate. APIs are sometimes available,[1] but they are not amenable to text analysis, web scraping, and data cleaning also faces challenges. This is partly understandable: traditionally, these archives were designed to serve the needs of legislative staff, political actors, citizens, or journalists (Joshi & Rosenfield, 2013); thus, they are less amenable to systematic data collection, even in a Western European context (Kiss & Sebők, 2022). However, empirical researchers have different data needs from other stakeholders: they search for comprehensive data (e.g., the full population of speeches in a given period) in a standardised, structured, machine-readable format. Fortunately, most legislatures offer full texts and metadata for speeches and legal documents, but in many cases, the onus is still on the researcher to process them into a structured format.

In this research note, we bridge part of this gap regarding the CEE region by presenting a new database: ParlText CEE. The database was prepared under the auspices of

[1] The Czech (https://www.psp.cz/sqw/isp.sqw) and Hungarian (https://www.parlament.hu/alkalmazasok) APIs are available after registration, while the Polish one (https://api.sejm.gov.pl/sejm.html) is available without further registration.

the V-Shift Momentum project at the HUN-REN Centre for Social Sciences with the financial support of the Hungarian National Laboratory for Artificial Intelligence.[2] It includes data on the unicameral legislatures of Hungary and Slovakia and the lower chambers of the bicameral Czech and Polish legislatures (the Chamber of Deputies and the Sejm). The main advantages of the ParlText CEE dataset compared to other databases are its wider time frame, larger metadata collection, and a relational database structure for its distinct subcorpora covering all plenary activities in terms of speeches, bills, and laws. The 1.0 version of the dataset currently covers almost 1.9 million text vectors and metadata for the subcorpora of the legislative processes of all four CEE countries. The time frame in all cases covers the democratic period, starting in the early 1990s until the 2020s. Metadata include relevant dates (such as the initiation or adoption of bills), texts, titles, and, in the case of the speech corpora, parliamentary agendas, speaker names, and parties. An additional contribution of the project is that all data are linked based on a unique identifier following the ParlLawSpeech standard. This allows for connecting each bill to its adopted final version as law and all the plenary debates that took place in connection to them.

The ParlText CEE database was built on an open-science framework. All data is published in public repositories, providing access based on the CC BY-NC license (Attribution-NonCommercial 4.0 International), constituting its only official version. This paper introduces the specifics of the 1.0 release of ParlText CEE and contemplates its possible use cases. After briefly introducing some precursor datasets in the field of legislative studies, we present the structure of the ParlText CEE database through a description of the main variables in the database's codebook. Next, we detail the data linkage methods, followed by an overview of some descriptive statistics of the database. In the Conclusion, we suggest potential use cases for the database in political science and beyond.

2 Precursors of ParlText CEE

Although the CEE region often lags behind its Western European counterparts in terms of the availability of ready-made textual corpora, there are some important precursors that a project aimed at collecting and publishing data for the countries of the Visegrad Four can build on. Such databases that offer machine-readable corpora for the CEE region include CLARIN, CAP, ParlEE, ParlSpeech, and the ParLawSpeech project (for a more detailed overview, see Sebők et al., 2025). As Table 1 presents, at least one of the ParlText CEE target countries is included in these datasets.

[2] The ParlText CEE database has no connection to the British Parliament's or the Australian legislature's Teletext service of the same name (ParlText). For more info on these services, see Parliament of Australia (1991). Department of Parliamentary Reporting Staff – Report for – 1990–91, https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22publications%2Ftabledpapers%2FHPP032016008744%22;src1=sm1, and Select Committee on Broadcasting Minutes of Evidence, 1998. and Select Committee on Broadcasting Minutes of Evidence (1998). ANNEX 1. THE PARLIAMENTARY CHANNEL https://publications.parliament.uk/pa/cm199798/cmselect/cmbroad/984/8071503.htm

Table 1 Precursor projects of ParlText CEE

Dataset name	N of polities	Coverage of CEE countries	Domains	Maximum timespan
CLARIN	29	Czechia, Hungary, Poland	Speech	2015–2022
CAP	27	Hungary	Speech, bill, law, media etc.	1000–2023
ParlEE	28	Czechia, Hungary, Poland, Slovakia	Speech	2009–2019
ParlSpeech	9	Czechia	Speech	1987–2019
ParlLawSpeech	8	Czechia, Hungary	Speech, bill, law	1993–2022

The Common Language Resources and Technology Infrastructure (CLARIN) project, one of the EU's so-called ESFRI roadmap of major research infrastructures, developed several datasets on different European countries. The ParlMint dataset contains the annotated corpora of 29 European countries and autonomous region's parliamentary debates, which–at the time of writing–makes it the dataset with the most comprehensive coverage of legislative debates in Europe in a unified structure (Erjavec et al., 2023a; Erjavec et al., 2023b; Kuzman, 2023). Its first wave included Bulgaria, Croatia, Czechia, Hungary, Latvia, Lithuania, Poland, and Slovenia. The second one added Bosnia and Herzegovina, Estonia, Romania, Serbia, and Ukraine from the CEE region, mainly for 2015–2022.

The datasets are available in XML format. The corpora were pre-processed (tokenisation and lemmatisation) and linguistically annotated, and several types of metadata were also included (e.g., gender of the speaker). The ParlaMint corpora[3] are also divided into periodical subcorpora, such as speeches made during the COVID-19 pandemic. However, it does not contain information on legal documents (bills and laws) and, therefore, is not directly applicable to the joint analysis of all legislative procedures. Furthermore, the processed datasets follow the TEI XML technical standard, which is more common in the digital humanities and is not directly compatible with the workflows in the programming languages most prevalent in the social sciences (such as R and Python) due to its unique data structure. The corpora were developed based on web-scraped data (Mikušek, 2024).

The second significant collection of legislative data is associated with the Comparative Agendas Project (CAP).[4] This international collaboration of several dozen country projects investigates several arenas of the policy agenda (Baumgartner et al., 2019). Besides countries, the datasets also contain information on both supranational entities (e.g. the European Union) and substate-level regions (e.g. the State of Florida) for different periods (but mainly for the decades around the 2000s). The CAP project's datasets contain information not only on legislative speeches (although in most cases only on a selected,

[3] https://www.clarin.eu/parlamint
[4] https://www.comparativeagendas.net/datasets_codebooks

important component of them, e.g. parliamentary questions or State of the Union speeches) but also on legal documents such as laws and bills. For the purpose of a unified legislative textual database for CEE, it has two drawbacks. First, as CAP researchers focus on classifying documents by their policy content, including the full corpus is not a requirement, and this is often missing. Second, the CEE region is scarcely covered, with datasets available only from Croatia, Hungary, and Poland.

Third, the V3 version of the ParlEE project[5] encompasses the parliamentary speeches of 28 polities covering the timespan between 2009 and 2019 (Sylvester et al., 2024). These speeches were broken down into sentences and annotated with date, speaker, party, references to the EU governance, and policy topics (based on the Comparative Agendas Project classification method). Although all target countries of ParlText CEE are included in ParlEE, the dataset does not contain information on bills and laws. Moreover, its time frame is shorter than what may feasibly be covered with publicly available data.

The fourth important precursor is the ParlSpeech project.[6] It also comprises an extended corpus of legislative speeches, including over six million parliamentary speeches from nine countries (Rauh & Schwalbach, 2020). In addition to the speeches' texts, it includes essential metadata, such as date, agenda item title, and party names based on Döring and Regel's Party Facts database (Döring & Regel, 2019). Here, the CEE region is only represented by Czechia, and similarly to the abovementioned databases (with the exception of CAP), the dataset is speech-only.

The ParLawSpeech project[7] extends the corpora of ParlSpeech into new text domains: bills and laws. It covers data from eight legislative bodies, including the European Parliament. Variables in these datasets focus on relevant metadata (such as dates, speakers/initiators, agenda titles, and party affiliations in the case of speeches, where available) alongside the full-text vectors for all bills, laws, and speeches. The covered time frame differs by country, but at least 11 years of data are available for all legislatures, mostly covering the 2010s. The novelty of the dataset lies in linking the three domains of texts: researchers can find the bill discussed by a given parliamentary speech and the respective law text after the bill's adoption. The dataset includes two countries from the CEE region, Czechia and Hungary, and, similarly to its predecessor project, ParlSpeech, it covers a more limited time frame than what is publicly available (Proksch et al., 2024).

Finally, we mention an additional database that was less of a precursor than a complementary corpus. The Vitrin Démocratique database (Tremblay-Antoine et al., 2024) contains valuable information on European Parliament debates in both the speech's original language and its English translation for the period 2014–2023. Similarly to the EP corpus of ParlLawSpeech, it brings more information to the table on politicians representing the CEE region and allows for a multi-level analysis of MP behaviour.

[5] https://pureportal.strath.ac.uk/en/datasets/parlee-plenary-speeches-v3-data-set-annotated-full-text-of-10-mil
[6] https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/L4OAKN
[7] parllawspeech.org

3 Database structure

The ParlText CEE database builds on its predecessors by building on available data for Czechia and Hungary, extending their time frame and metadata collection via data linkage, and presenting entirely new data collections for Poland and Slovakia[8]. The ParlText CEE database comprises three UTF-8 encoded corpora in a .rds format for each country: bills, laws, and parliamentary speeches. The respective texts and metadata were web-scraped directly from the legislatures' archives to obtain newly added data points. Tables 2 to 4 present the variables from these three collections.

Table 2 Description of the core variables in the speech corpora[9]

Variable	Type	Description
speech_ID	string	The unique identifier of the speech (ISO_S_YYYYMMDD_N)
link	string	The link to the given speech
agenda	string	Agenda item title under which the speech was given (9998 if there is none, as in the case of pre/post-agenda speeches)
electoral_cycle	string	Electoral cycle during which the speech was given
speechnumber	integer	The rank order of the speech within the given session
speaker	string	The name of the speaker
chair	logical	Dummy variable indicating whether the speaker is the parliamentary chair
date	date	The date of the speech (YYYY-MM-DD)
speech_text	string	The text of the speech
bill_ID	string	The id of the bill(s) discussed (ISO_B_YYMMDD_N); if multiple bills are related to the speech, their IDs are separated by a comma; if the speech is not connected to any bills, it is marked with 9998

Data linkage was implemented with the help of three different ID types: bill_ID, law_ID and speech_ID. All three serve as the unique identifiers of the observations of their respective datasets. The bill_ID serves as a common link across the corpora (we return to the details of the linking process below). Bill_IDs are based on the conventions of the respective parliament or the official legislative database of the country. The same applies to

[8] We would like to express our gratitude to Jakub Szabó for his contributions related to the dataset on Slovak legislative speeches.

[9] The Slovakian speeches corpus in its 1.0 version does not contain the following variables: *link*, *agenda*, *speechnumber*, and *bill_ID*

law_IDs. In contrast, speech_IDs were generated after data collection. There are instances where the given speeches were not related to a specific bill (or law), annotated as '9998'. Missing values were marked by '9999' in the datasets.

The first corpus consists of the full-text vectors of parliamentary speeches and their respective metadata, similar to the ParlEE and ParlSpeech datasets (Table 2). A unique speech_ID was created, comprising four segments separated by an underscore. This consists of the countries' ISO 3166 codes, the letter S (as an abbreviation for speech), the date of the speech, and a marker of the chronological positions of the speech within the day. As it is essential for both validation and archiving purposes, the URL of the original link to legislative websites/APIs for the given speech is also provided. The agenda items are also listed, allowing for combining texts and filtering for specific debates (agenda titles also served as the basis for linking speeches to bills and, via the bills, laws). The name of the chair is included to track legislative activity (they contextualise agenda items) and allows for excluding procedural information. The dates of the speeches (YYYY-MM-DD) and the electoral cycles, which were calculated based on the dates, are also provided. The latter are essential for connecting speeches to political variables such as legislative majorities and government periods.

Table 3 Description of the core variables in the bills corpora

Variable	Type	Description
bill_ID	string	A unique ParlText CEE identifier to the bill, also used for linking across corpora (ISO_B_YYMMDD_N)
bill_link	string	Link to the bill's parliamentary data sheet
electoral_cycle	string	The electoral cycle during which the bill was introduced
bill_title	string	The title of the given bill
date_introduced	date	The date of the bill's introduction (YYYY-MM-DD)
number_document	integer	The record number under which the bill was introduced
bill_text	string	The text of the bill

The second dataset, presented in Table 3, is a collection of bills introduced in parliament comprising titles, cleaned bill texts, and metadata. Similarly to the corpora of speeches, the bills' respective links, their date of introduction, and the electoral cycles are also provided. The original record numbers (number_document) were kept for traceability, as they serve as the official identification for the bills. Bill_IDs were created based on the respective legislative systems. They encapsulate the countries' ISO 3166 codes, the letter B for the bill, the proposal's date, and the original document's number.

The corpus of adopted laws contains their titles and cleaned full-length texts (Table 4). The respective links on which the laws can be accessed are also included, as well as their date, year, and electoral cycle of publication. Law IDs were constructed in a similar manner

to bills and speeches. They contain the countries' ISO 3166 codes, the letter L for law, the year of publication in YYYY format, and the record number under which they were published, all separated by an underscore.

Table 4 Description of the core variables in the laws corpora

Variable	Type	Description
law_ID	string	The unique identifier of the law text (ISO_L_YYYY_N)
law_link	string	Link to the law text
law_text	string	Full text of the law
electoral_cycle	string	The electoral cycle during which the law was introduced
year_published	integer	The year of the law's publication
number_published	integer	Record number under which the law was published
date_published	date	The date of the law's publication
law_title	string	The title of the law
bill_ID	string	The unique identifier of the bill whose accepted version the law is (ISO_B_YYMMDD_N)

4 The linkage structure of ParlText CEE

The structure of ParlText CEE allows for the creation of linkages with other database formats. We followed the standards defined by the creators of ParlLawSpeech (Proksch et al., 2024). Here, we only present the basics of this approach. The three corpora, the legislative speeches, bills, and laws are linked on the country-dataset level. The logic of the linkage is rooted in information on the legislative procedure. In a generic process, after bills are introduced, a decision is made (in many cases by the speaker/president of the legislative body) on whether they can proceed first to committees and then to the plenary. If they are put on the plenary legislative agenda, they are discussed among MPs in legislative speeches. If a required majority of members of parliament (MPs) support a bill and they adopt it, the bill becomes law. In short, some speeches discuss bills (as prospective but not necessarily adopted laws). Some speeches are unrelated to bills and laws: they can, inter alia, be procedural in nature, connected to resolutions of the given house of parliament, or pre/post-agenda political debates.

The linkage of different corpus types can open up new avenues for research seldom leveraged in legislative studies. However, the methodological process leading there is riddled with challenges. While the Polish and Hungarian legislature's official website contained structured information on the relationship between speeches and the bills, the same did not hold for the Czech and Slovakian parliament. Figure 1 shows two examples of the Polish and Hungarian parliaments' websites. They represent well-structured tables

containing hyperlinks to the texts of parliamentary speeches under the speakers' names. In the third column of the Polish database, the agenda titles are listed and contain the official IDs of the discussed legislative documents (in this example, 3447 and 4278). In the Hungarian parliament's database, the header contains the same information on the agenda item title and the official ID(s) of the discussed documents (in this example, H/19861).

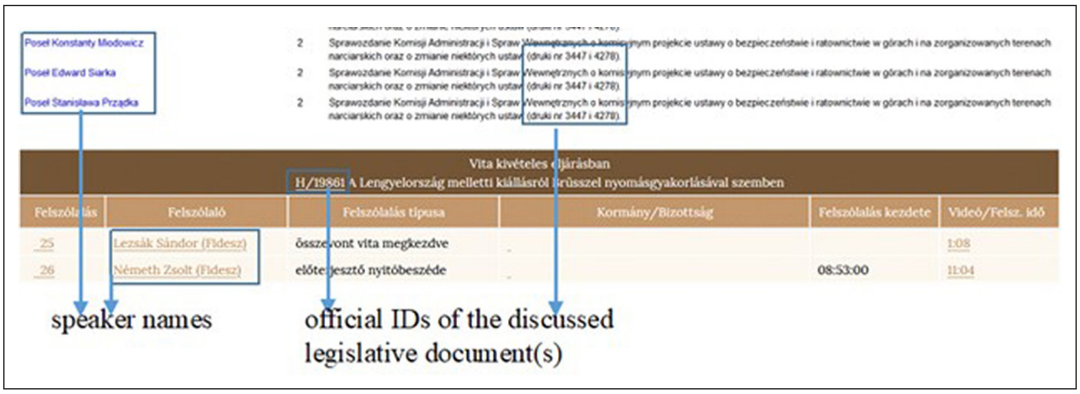

Figure 1 Examples of linking speech and bill texts from the Polish and Hungarian legislatures' websites

It was more difficult to extract the same information from the official websites of the Czech and Slovak parliament. Although the Czech legislature developed a similar structure for most electoral cycles, in some cases, extra effort was necessary. For these electoral cycles, the chair of the assembly sessions regularly presented the new agenda item title in bold on the official website, as shown in Figure 2. In these cases, until the next bold agenda item name, all speeches were connected to the given agenda item. The underlined bold speaker names tagged the speeches' beginning. In most cases, the agenda item title also contained the official IDs of the discussed legal documents. An easy way to validate this method for linking data is to check chair interventions, as they regularly enlist agenda items at the beginning of the session in the same order as they are discussed later.

Felszólalás	Napirendi pont	Önálló indítvány
1	Ülésnap megnyitása	
2-4	Napirend előtti felszólalások	„Aktuális ügyeinkről"
5-8	Napirend előtti felszólalások	"Aktuális ügyekről"
9-12	Napirend előtti felszólalások	"Aktuális közügyek"
13-16	Napirend előtti felszólalások	"Mikor lesz a magyar mukavállaló és a magyarok lakhatása az első?"
17-20	Napirend előtti felszólalások	"Aktuális kérdésekről"
21-26	Napirend előtti felszólalások	"Gyermekeink védelméről"

Figure 2 Examples of the extraction of agenda item names (Czech and Hungarian)

Another problem with linking data occurs when an agenda item is devoted to multiple legal documents. In such cases, we connected all documents mentioned in the agenda item name to the speeches listed under the agenda item. As bills are the central element of the linkage procedure (since all laws originated in bills, but not vice versa), bill IDs are included for each observation of the legislative speech dataset and the dataset of laws. A separate code was assigned for speeches unrelated to bills and laws (see above).

We illustrate the linking process by using an example from the Czech corpora. The bill_ID 'CZE_B_190626_535' was introduced under the title 'o bezpečnosti práce' ('On occupational safety') on 26 June 2019. The legislative debate started almost two years later, on 23 March 2021. It was a relatively short debate, as in addition to the speaker of the Chamber of Deputies presiding over the debate, only eight speeches were held connected to the law, and these speeches were presented by only five speakers. After the first debate, the bill was adopted on 23 April 2021 after three speeches presented by two speakers. The law was approved by both chambers on 9 June 2021 under the title 'o bezpečnosti práce v souvislosti s provozem vyhrazených technických zařízení a o změně souvisejících zákonů' (in English 'On occupational safety in connection with the operation of reserved technical equipment and on changes to related laws') as law 250/2021. This example shows how procedural metadata can be leveraged in a potential debate-focused analysis of a single bill.

5 Descriptive statistics

Table 5 summarises the three corpora (laws, bills, and speeches) by country. The time frame slightly differs between the countries, but they are all designed to encompass at least 30 years. Most corpora contain data from the post-transition period at the earliest (early 1990s) until the latest available data points (between 2022 and 2024). The selection of relevant parliamentary websites/URLs was based on expert decisions. The final sources included scraped files from legal databases, national parliamentary websites, and databases from previous data collections prepared by our research team (cap.tk.hu). The values presented for the Polish datasets are subject to change upon additional validation in progress at the time of submission.

A validation check on the corpora partly relied on an R script developed by the ParlLawSpeech team. The multi-step process encompassed both automated and manual checks. First and foremost, general completeness was tested, searching for duplicates and missing values in the texts and metadata columns. Further inspection was needed in the case of duplicates to check for, among other things, identically worded speeches. Verification of the number of observations against the source websites was also done after the scraping process, and further cross-validation using alternative sources, such as the above-presented ParlaMint database (when available). The expected quality of text content was ensured by extracting random samples and manually spotting error patterns (such as headings, footers, unnecessary breaks in texts, or even incorrect encoding). We also conducted a uniqueness check of the respective links using random manual evaluation.

Table 5 Summary of the laws, bills, and speeches corpora by country

Country	Data	Count	Time frame	Source
Czechia	*Laws*	3,214	1990–2023	wolterskluwer.cz
	Bills	5,284	1990–2023	nrsr.sk, psp.cz
	Speeches	*574,548*	1990–2023	psp.cz
Hungary	*Laws*	4,303	1994–2022	cap.tk.hu
	Bills	7,498	1994–2022	cap.tk.hu
	Speeches	*487,877*	1994–2022	cap.tk.hu
Poland	*Laws**	*5,716*	1991–2023	sejm.gov.pl
	*Bills**	*9,488*	1991–2023	sejm.gov.pl
	*Speeches***	*261,802*	2011–2023	sejm.gov.pl
Slovakia	*Laws*	4,260	1990–2023	slov-lex.sk
	Bills	*NA*	NA	nrsr.sk
	Speeches	*423,952*	1994–2023	psp.cz, nrsr.sk

Notes: * Estimated counts pending final validation; ** Estimated count for the 1991–2023 period is about 716,000.

The dataset contains all speeches, bills and laws until the end of the last closed electoral cycle in the case of Hungary, Poland and Slovakia. Because the current electoral cycle of Czechia is near to its end, we decided to scrape data until the end of 2023.

The most important results of these processes for the fully finished datasets are summarised below (Table 6). We present the number of textual, link and ID duplicates in the three corpora for each country and indicate if linking through the datasets was possible. It is important to note that due to the structure of the Czech and Slovak parliament's website, the same link is associated with multiple speeches, as they are listed on the same page. The high number of speech duplicates is usually caused by identically worded texts (such as greetings) and can be cross-referenced by checking unique links. However, further cleaning and deeper investigation may be needed in the case of speeches, as link- and ID duplicates can signal scraping errors.

A set of figures was also generated for the Hungarian corpora to check the dataset's quality and explore potential outliers and data errors. For instance, visualising distributions can help detect potential anomalies after data collection. Figure 3 depicts the number of Hungarian bills introduced between 1994 and 2021. As seen on the plot, there are no systematic errors in the corpus (missing values or unusual trends due to scraping mistakes, for example). The number of bills is reasonably balanced throughout the period, except for some outliers.

Table 6 Summary of the validation check on the corpora

		Czechia (2013–2023)	**Hungary (1994–2022)**
Text duplicates (NAs)	*Laws*	0 (0)	0 (0)
	Bills	33 (33)	31 (2)
	Speeches	*2,581* (0)	67,080 (2)
bill_ID duplicates (9998s)	*Laws*	0 (0)	0 (0)
	Bills	0 (0)	0 (0)
	Speeches	*191,527* (60,956)	35,232 (0)
Link duplicates (NAs)	*Laws*	0 (0)	– (–)
	Bills	0 (0)	0 (0)
	Speeches	*166,983* (0)	35,232 (1)
Linking		Validated	Validated

Note: Table 6 provides an overview of the results of the validation processes for the Czech and Hungarian corpora. We present the number of duplicates in texts, bill_IDs, and links, marking the number of NAs, as well as signalling if linking through the datasets is possible. The results of the two law corpora overall indicate that the files are clean, and the preprocessing and linking through bill_IDs were done correctly. Identical bill texts in the Czech case indicate missing data. Although negligible, this required further investigation in the Hungarian corpus. In the case of speeches, the large quantity of bill_ID duplicates indicated that multiple speeches were made on the same bill, while 9998s marked speeches unrelated to an agenda point. Link duplicates in the Czech speech corpus arose due to the structure of the source website and did not signal a real issue.

A similar observation can be made regarding the fluctuation of the number of laws published throughout the years (Figure 4). Although there are periods with higher frequencies, the number of published laws fluctuates within a reasonable range. Notably, the extreme values in the two datasets seem to align well, pointing toward potential institutional factors (such as the number of sessions).

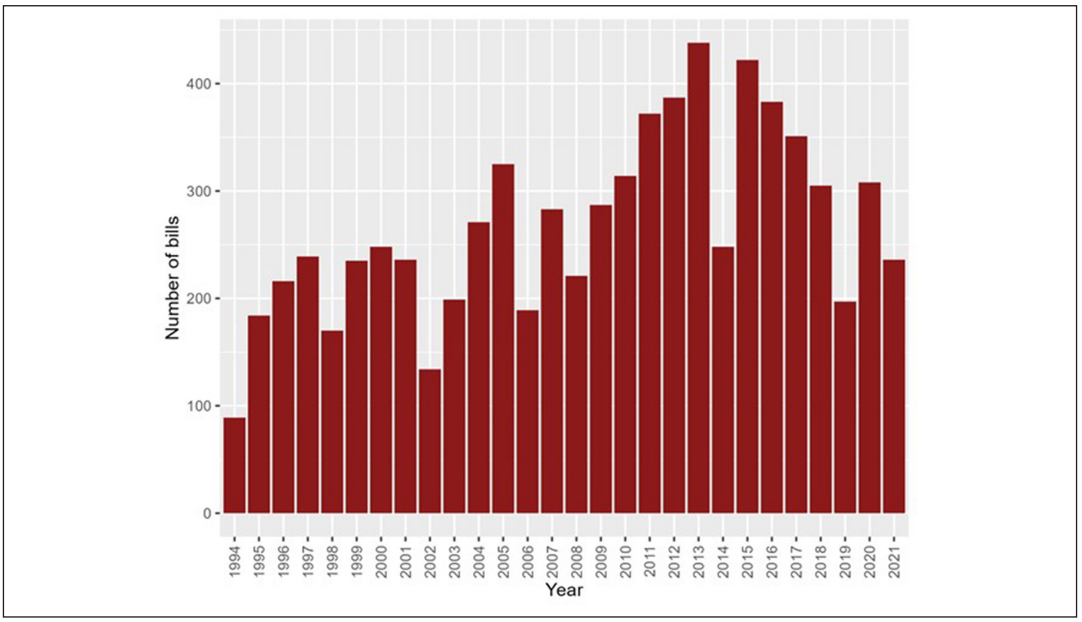

Figure 3 Distribution of Hungarian bills between 1994 and 2021

Note: Figure 3 shows the distribution of bills introduced in Hungary between 1994 and 2021. Since 2022 was an election year, we decided to exclude these observations from our figures (the electoral cycle ended in May).

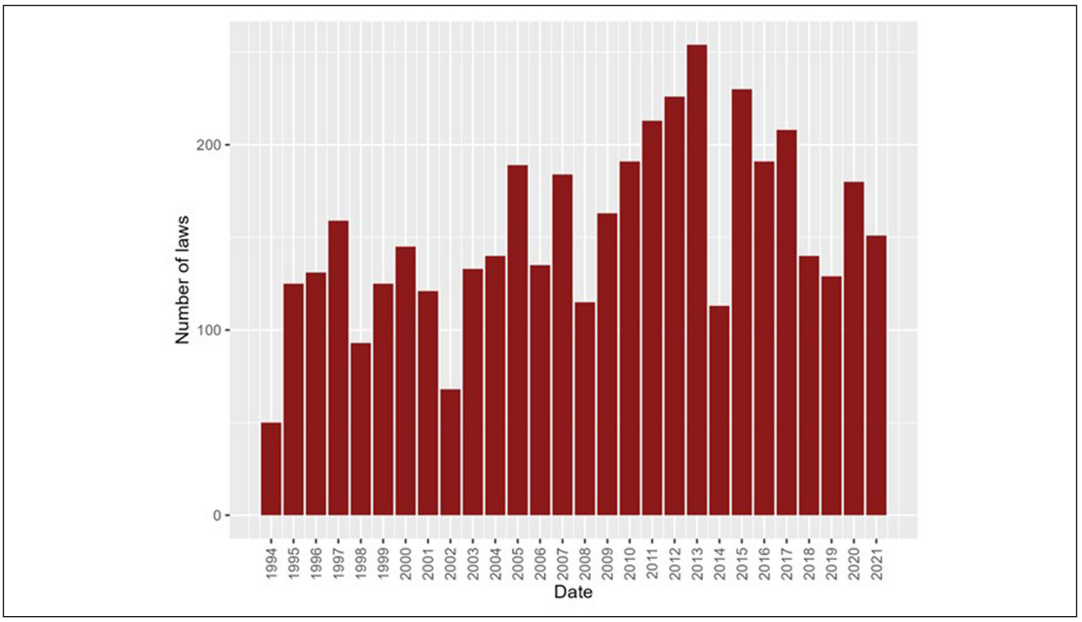

Figure 4 Distribution of Hungarian laws between 1994 and 2021

Note: Figure 4 shows the distribution of laws published in Hungary between 1994 and 2021. Observations from 2022 are excluded, as it was an election year.

A similar pattern emerges when examining the frequency of speeches delivered by MPs over the same period (Figure 5). Again, the data is consistently distributed with occasional outlier spikes, indicating a relatively stable pattern of speech activity. Moreover, comparing these patterns with those observed in the bills that were introduced and laws published, it is evident that while there may be correlations, each dataset possesses its own unique characteristics and dynamics.

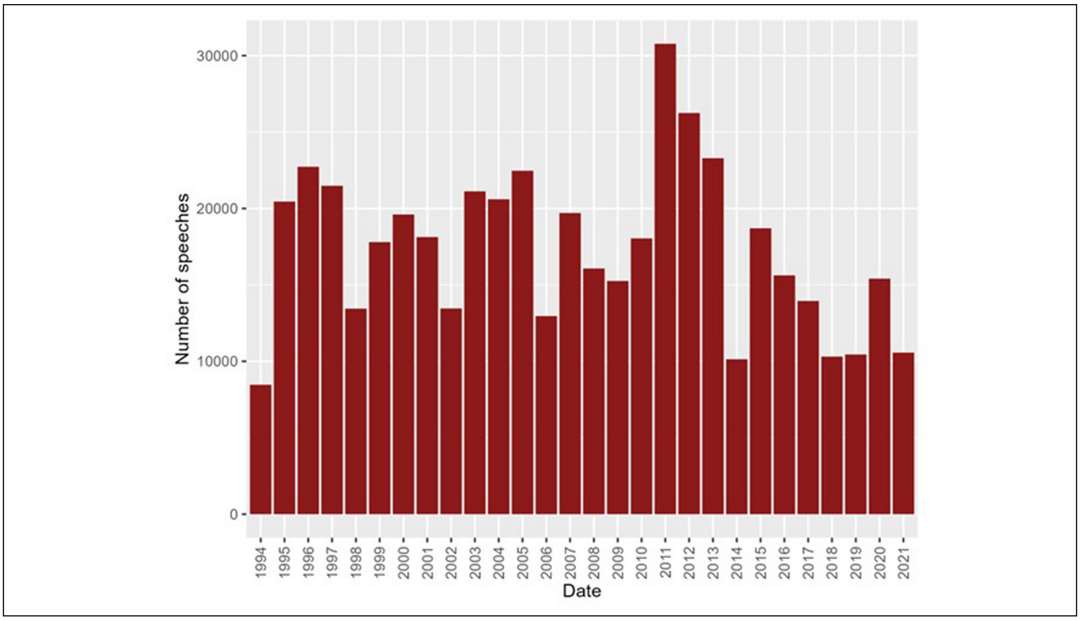

Figure 5 Distribution of Hungarian speeches between 1994 and 2021

Note: Figure 5 shows the distribution of speeches held in the Hungarian parliament between 1994 and 2021. The histogram indicates a relatively stable pattern of speech activity. Observations from 2022 are excluded, as it was an election year.

Another valuable approach to identifying anomalies involves examining the length of bills and laws linked to each other, measured in terms of their character count, as depicted in Figure 6. While a close and nearly linear correlation is evident, there are prominent outliers in the length of bills.

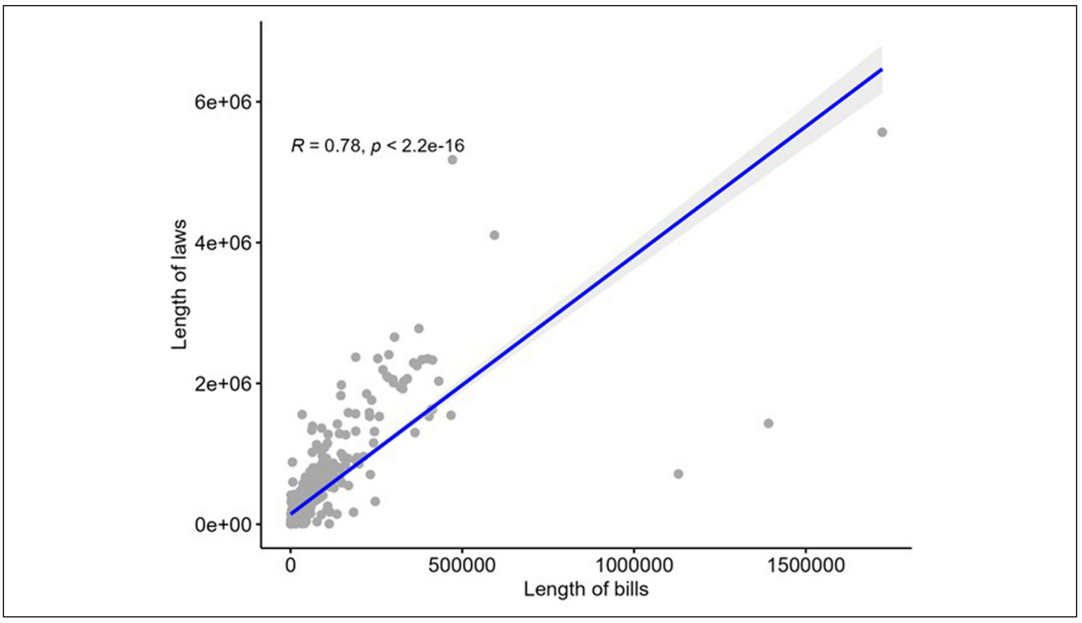

Figure 6 Correlation between the length of laws and bills in Czechia between 2013 and 2023

Note: Figure 6 depicts the correlation between the length of the *bills* measured in characters (x-axis) and the length of the *laws* measured in characters (y-axis). Based on the linear approximation, a strong correlation is assumed between the two.

6 Conclusion

The potential use cases of ParlText CEE are associated with a wide range of research questions concerning legislative processes, trends, and patterns of legislative activity. One such research area may be polarisation (e.g., measuring polarisation by the diversity of the legislative speeches of different political groups on the same bills). Researchers of the politics of parliamentary debate (see Back et al., 2022) and legislative studies more generally (see Benoît & Rozenberg, 2020) can utilise the new database as an input for discourse analysis, investigation of policy frames, or party issue ownership.

Figure 7 illustrates one such application: the frequency of speeches in the Hungarian parliament during each plenary meeting, categorised by political parties (from 1994 to 2022). By examining the patterns and fluctuations depicted in the figure, researchers can gain insight into the varying degrees of legislative activity of political parties over time and directly juxtapose this with their other legislative actions (the proposal of bills, for instance) as well as their issue or policy topic attention .

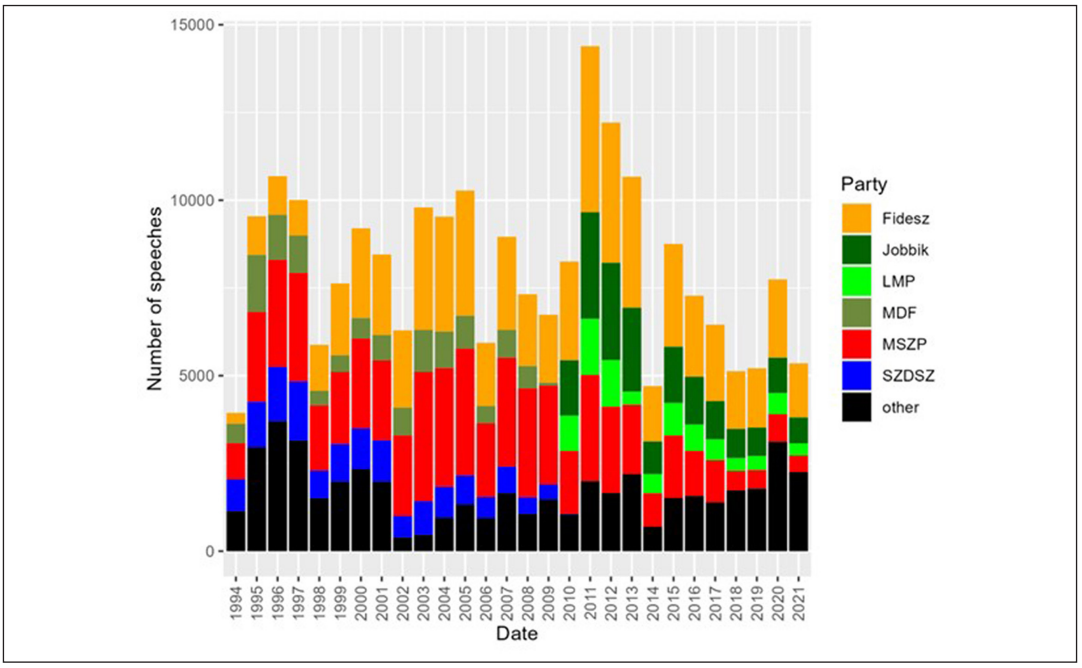

Figure 7 Number of speeches made on each session day by parties (Hungary, 1994–2021)

Note: Figure 7 is a bar plot of the number of speeches held by larger parties (see legend) in the Hungarian parliament between 1994 and 2021. Speeches held by the chair of the respective sessions were excluded, as they regularly do not contain relevant information besides the agenda item titles and names of the next speaker. Observations from 2022 are excluded since it was an election year.

Given the relative scarcity of legislative data for the Central-Eastern European region, ParlText CEE may fill a gap in our understanding of legislative politics by allowing for expanding research designs that mainly focus on the U.S. or Western Europe. It may also serve as a stepping stone for generating new ideas and understanding the unique features of legislative politics in the region. It contributes to pre-existing data collections by applying a wider time frame, larger metadata collection, and a relational database structure for its distinct subcorpora, covering all plenary activities regarding speeches, bills, and laws.

An additional contribution of the project is that all data are linked based on unique identifiers following the ParlLawSpeech standard, allowing each bill to be connected to its adopted final version as law and all the plenary debates that took place in connection with it. Finally, the procedures developed for the 1.0 release of ParlText CEE can be readily replicated with additional countries in the region and beyond with the help of the detailed description of procedures and open-access repository of data and scripts.

In conclusion, we briefly present three potential use cases for the new database that would allow for the extension of branches of the literature to the CEE region. The analysis of gender issues related to legislative politics is a mainstay in the relevant West European and North American literature. Ash et al. (2024) investigated nonverbal reactions during

legislative debates. The authors employed a latent Dirichlet allocation on a corpus of German state parliamentary speeches to quantify gender congruency by analysing the relative usage of topics associated with each gender. Their findings suggest a potential bias: although female MPs receive more reactions altogether (both positive and negative) than men, 'women's topics' usually generate less interaction, especially when associated with male MPs.

This topic would make a good subject for comparative research with the inclusion of the CEE region due to its smaller proportion of female MPs. Figure 8 depicts the share of speeches made by male and female speakers in the Hungarian Parliament, highlighting the gender disparity in legislative representation within the region. This visualisation supplements current research by providing empirical data on the gender composition of parliamentary speakers. Such data is essential for understanding the dynamics of parliamentary debates. By examining this ratio, we can explore how the smaller proportion of female speakers may influence legislative processes and interactions, thereby contributing to a more comprehensive analysis of gender issues in legislative studies.

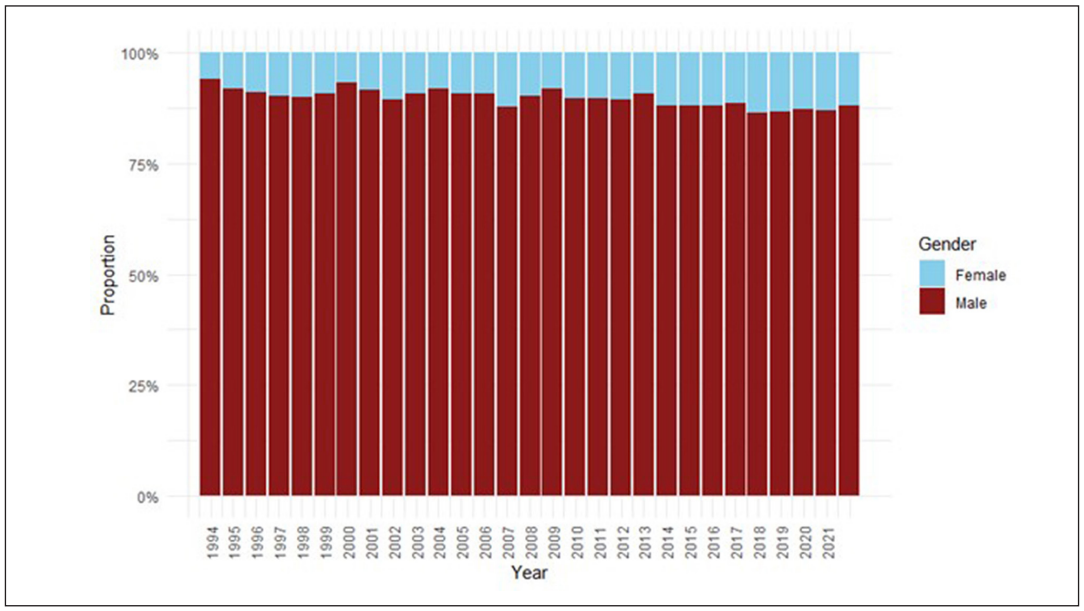

Figure 8 Proportion of speeches made by male and female speakers in the Hungarian Parliament between 1994 and 2022

Note: Figure 8 shows the proportion of speeches made by female and male speakers (including persons who were not MPs in the given electoral cycle) in the Hungarian Parliament between 1994 and 2022. Speeches delivered by the chairs of the respective sessions were excluded to avoid distorting the proportions.

A second theme of interest is environmental and climate policy. Investigating the impact of economic shocks on parliamentary discourse offers valuable insights into policy priorities. Finseraas et al. (2021) employed a difference-in-differences approach with a structural topic model to analyse speeches in oil-dependent Norway during the 2014–2015 oil price

shock. They anticipated a decline in environmental discussions in oil-producing regions. However, their findings suggest a continued emphasis on the 'green shift' topic, potentially reflecting a strategic pivot towards green investment. While CEE countries differ in their energy dependence, a similar research design could be illuminating, revealing how, e.g., the dependence on Russian energy shapes parliamentary discourse on sustainability.

A third topic of interest is related to the transformation of European party systems. Schwalbach (2023) examined party interaction in parliamentary debates across Denmark, Germany, Netherlands, and Sweden following the entry of populist radical-right parties (PRRPs). Utilising correspondence analysis and dictionaries, the study focused on daily parliamentary interactions. While his findings suggest limited overall realignment of the traditional government-opposition structure, debates on immigration revealed a significant polarising effect by PRRPs. Given the growing prominence of PRRPs in the CEE region, a similar investigation into the V4 parliaments would be valuable.

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Data availability statement

The data collected under the ParlText project and the repository made for the replication of the tables and figures in this article are available at parltext.org.

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Exploring the potential and limitations of large language models as virtual respondents for social science research

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Abstract

Social and linguistic differences encoded in various textual content available on the internet represent certain features of modern societies. For any scientific research which is interested in social differences mediated by language, the advent of large language models (LLMs) has brought new opportunities. LLMs could be used to extract information about different groups of society and utilized as data providers by acting as virtual respondents generating answers as such.

Using LLMs (GPT-variants, Llama2, and Mixtral), we generated virtual answers for politics and democracy related attitude questions of the European Social Survey (10th wave) and statistically compared the results of the simulated responses to the real ones. We explored different prompting techniques and the effect of different types and richness of contextual information provided to the models. Our results suggest that the tested LLMs generate highly realistic answers and are good at invoking the needed patterns from limited contextual information given to them if a couple of relevant examples are provided, but struggle in a zero-shot setting.

A critical methodological analysis is inevitable when considering the potential use of data generated by LLMs for scientific research, the exploration of known biases and reflection on social reality not represented on the internet are essential.

Keywords: computational social science; large language models; GPT; Llama; Mixtral

1 Introduction

Large Language Models (LLMs) are multi-purpose deep neural networks trained on very large corpora (Touvron et al., 2023), so that they do not require substantial modification to solve specific problems. The emergence of such deep learning (DL) models has created a new opportunity for social scientific research. For both qualitative and quantitative empirical research where language mediates information gathered from people, it has become a realistic possibility to generate responses – 'silicon samples' (Argyle et al., 2022) – using virtual respondents simulated by LLMs as data providers. Social psychology experiments (e.g., Milgram's experiment) have already been replicated with a virtual agent and testing was also done on political opinion research (Aher et al., 2023). Studies in this

direction suggest that the linguistic richness of large language models can faithfully represent real human responses and reactions. Argyle et al. (2022, 2023) showed that for the American National Election Studies survey (ANES, 2021), the silicon sample generated by the GPT-3 model (Brown et al., 2020) passed the so-called social science Turing test, i.e., the researchers could not distinguish between the responses of real people and simulated fictitious respondents.

The quality of the data generated by LLMs depends largely on the way it is extracted, thus the methodology of prompt engineering – finding the best inputs for the desired outputs – has been rapidly developing (Yao et al., 2023). A critical question in extracting data for social research purposes is which prompt should be used to define the context that activates the appropriate patterns in the model to get relevant responses. The potential of LLM-generated data is such that methodological and critical analysis are of paramount importance. From a positivist perspective, if the methodology of virtual data collection can be developed, the time and resources needed for real data collection can be reduced by rapid prototyping of research ideas using generated data, and aid preparation for human data collection with virtual pilot studies and support a wider scope for improving and supplementing (e.g., by imputation) the real data collected. It could also address the problem of declining validity of surveys' data due to low response rates.

Using LLMs (GPT-variants, Llama2, and Mixtral), we generated virtual answers for politics and democracy related attitude questions of the European Social Survey (ESS, 2022, 10th wave) and statistically compared the results of the simulated responses to the real ones. We explored different prompting techniques and the effect of different types and richness of contextual information provided. We also compared the performance of LLMs in three subsamples of ESS for three European countries: (1) Great Britain, (2) France, and (3) Hungary with each other, to detect differences coming from the unbalanced nature of the training data of LLMs. According to OpenAI (openai.com/research/gpt-4), GPT-4 reaches 85.5 per cent on the Massive Multitask Language Understanding benchmark (Hendrycks et al., 2021) in English, while performance drops to 83.6 per cent in French. Hungarian was not tested, but tendencies showed that model performance for a language is proportional to the number of native speakers of that language. The size of the training data makes it infeasible to precisely measure its language composition. In addition to the problem of language representation, a critical perspective is essential to ensure that the effects of already known biases of LLMs (Schramowski et al., 2022) do not remain unexplored in these applications, and even more so to consciously consider the social reality that is not represented in the linguistic space of the internet. Certain groups have less access to the online space or are less able to actively participate in it and generate content, so the visibility of those groups is lower, which also means that the content that concerns them is less represented in large language models.

2 Data and methods

Using four high performance LLMs: GPT-3.5-turbo, GPT-4-turbo, Llama-2-70b, and Mixtral-8x7B, we generated virtual answers for politics related attitude questions of the European Social Survey (ESS, 10th wave, subsets of Great Britain, France, and Hungary) and

compared the results of the simulated responses to the real ones. We explored different prompting techniques and the effects of different types and richness of contextual information provided to the models (e.g., zero-shot, five-shot with random examples, and five-shot with examples selected for similarity with the characteristics defined for the virtual respondent and real respondents in the dataset).

The validation process of the corresponding research involved measuring the algorithmic fidelity of the models with specific evaluation metrics depending on whether qualitative (e.g., open-ended textual) or quantitative (e.g., Likert-scale, or proper continuous measurement) responses were simulated. In the former case, the comparison of generated and real texts was done by human annotators, while in the latter case, the measurement level of the question of the chosen questionnaire dictated the choice of comparison metrics, e.g., distribution of answers, correlation patterns, and whether associations between variables were replicated.

In this research note we focus on the ESS survey question 'How interested would you say you are in politics—are you…', which was measured on a 4-point Likert scale ranging from 'very interested' to 'not at all interested' in the subsamples of Great Britain, France, and Hungary. The question from the ESS questionnaire provided for the LLMs was as follows: 'How interested would you say you are in politics? Are you (1) very interested, (2) quite interested, (3) hardly interested, (4) not at all interested?'

As preparation, we selected the variables that were found to explain political interest, by applying a regression model and exploring the effect of each socio-demographical variable involved in the model. The following variables turned out to be the most relevant ones in explaining interest in politics: gender, age, education level and political attitude measured on the left–right scale. Therefore, we used these when defining the socio-demographic characteristics of the virtual respondents and provided the models with the matching prompts. We used the original subsamples of the European countries and generated all virtual respondents based on the ESS survey data file. We created personas for the models to use when answering the question, for example the prompts were like:

- 'Pretend you are a British 20-year-old female with primary education who is slightly left leaning politically.'
- 'Pretend you are a French 30-year-old male with university education who is very left leaning politically.'
- 'Pretend you are a Hungarian 42-year-old female with vocational education who is very right leaning politically.'

We also checked the effect of examples provided to the LLMs by testing the

1. zero-shot setting, where no examples were given, only the persona and the question, and two five-shot settings:
2. with random examples (the personas and their real answers form the real data), and
3. with examples selected for similarity with the characteristics defined for the virtual respondent and real respondents in the dataset.

Thus n-shot learning is done through providing the model with n examples for solving a specific task in the prompt. The strength of this approach was highlighted in the original GPT-3 paper by Brown et al. (2020). For other performant prompting techniques see Wei et al. (2023) and Yao et al. (2023).

To mitigate the potential impact of imbalanced representation of languages in the training data of models, we decided to use English for all prompts. The reasoning was that this way the differences in language understanding of models across languages can be controlled for, while explicitly specifying the country should still allow the models to retrieve relevant information if it was encoded.

For the comparison of the LLMs with different prompting techniques and settings, we applied a two-level evaluation method. Firstly, we calculated the Kullback–Leibler (KL) divergence between the distributions of the real and silicon samples with bootstrapping (with 2000 bootstrap replications each case) to estimate the sampling distribution of divergence values. This first evaluation emphasizes distribution-level faithfulness, disregarding whether generated individual-level answers match the real ones. KL divergence was chosen because it is a ubiquitous measure of difference between probability distributions with a solid information theoretical background (Garrido, 2009) and can be interpreted as a measure of information lost by using the distribution from the model instead of the true distribution. Secondly, we fit the regression model on political interest with gender, age, education, and political preferences on the left-right scale as explanatory variables, then compared the standardized regression coefficients obtained from the generated values to the ones estimated from the real sample. The second evaluation relies on individual-level faithfulness, because the regression model grasps the correlation structure based on the values for the variables tied together by the individual. UMAP was used to visualize the standardized regression coefficients of the four explanatory variables for the different prompting setups. In the following section we show results for the above-mentioned two comparisons.

To assess the impact of the features in the tested setups on performance, we used a random forest model to predict the Kullback–Leibler divergence values comparing distributions of political interest in the real and simulated data. The explanatory factors were the number of examples (zero- vs. five-shot), the model (GPT-3.5-turbo, GPT-4-turbo, Llama-2-70b, Mixtral-8x7B), the country (GB, FR, HU), and whether examples were random or selected for the given persona.

3 Results

3.1 Interest in politics

The distribution of political interest is substantively and significantly different (chi-square test p-values < 0.0001) across countries as shown in Table 1. The answer category with the highest proportion is ‘quite interested’ for Great Britain (43.8 per cent), and ‘hardly interested’ for France and Hungary (with proportions of 40.6 and 45.1 per cent), but the latter two countries are quite different in the extreme categories (‘very interested’ and ‘not interested at all’).

Table 1 Distribution of political interest in the 10th wave of ESS by country. (Counts are unweighted.)

Answers	Frequency – GB [N]	Proportion – GB [%]	Frequency – FR [N]	Proportion – FR [%]	Frequency – HU [N]	Proportion – HU [%]
1 – very interested	231	20.1%	299	15.1%	66	3.6%
2 – quite interested	503	43.8%	478	24.2%	400	21.6%
3 – hardly interested	254	22.1%	802	40.6%	833	45.1%
4 – not at all interested	161	14.0%	398	20.1%	550	29.7%
Total	1149	100%	1977	100%	1849	100%

GB: Great Britain; FR: France; HU: Hungary; N: number of cases.

3.2 Kullback–Leibler divergences

Examination of Kullback–Leibler (KL) divergences between the human and the silicon samples revealed major differences across the LLMs and settings, see Figures 1 for Great Britain, Figure 2 for France, and Figure 3 for Hungary. The bootstrap distributions of KL are smoothed for visualization, but the values are always non-negative.

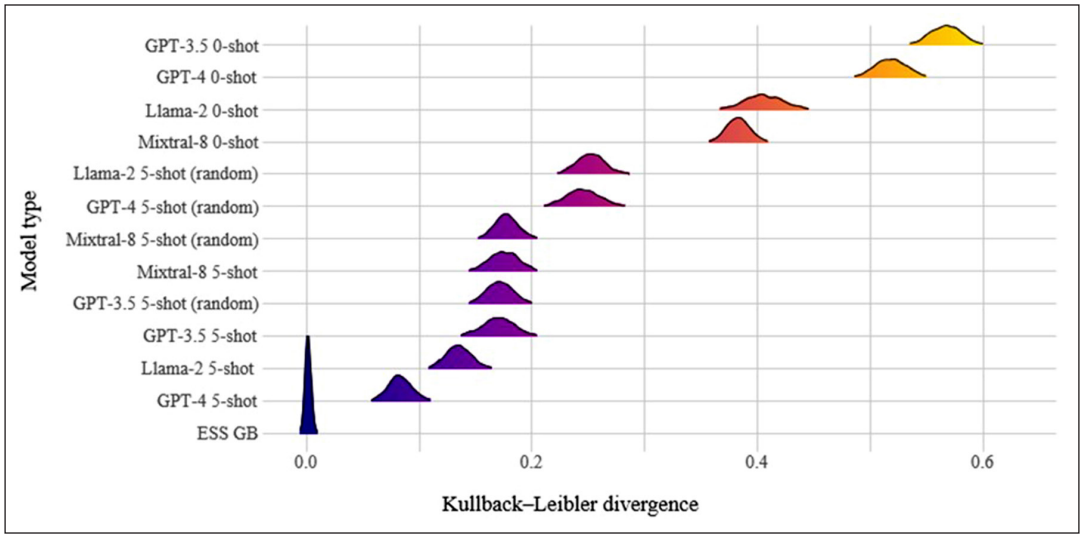

Figure 1 Bootstrap densities of Kullback–Leibler divergences between the distribution of answers for a question on political interest in the European Social Survey subsample of Great Britain (ESS GB) and the silicon samples generated by the tested LLMs with different prompting techniques

Horizontal axis: Kullback–Leibler divergence. Vertical axis: Density function value by model type and prompting technique, listing the combinations of various models, zero- and few-shot scenarios.

For the British subset (Figure 1), according to the Kullback–Leibler divergence, the five-shot GPT-4-turbo generated a distribution of answers closest to the original subsample, significantly better than all other models, the second best was Llama-2-70b. The next in ranking were four models with no significant difference: five-shot GPT-3.5-turbo with targeted examples, five-shot GPT-3.5-turbo with random examples, and five-shot Mixtral-8x7B with five targeted examples or random examples. The zero-shot LLMs were the least successful when comparing the KL divergences of the real and silicon samples, although Mixtral-8x7B and Llama-2-70b performed better than GPT-4-turbo and GPT-3.5-turbo with zero-shot. For the p-values of all pairwise comparisons, see Appendix Tables A1-3.

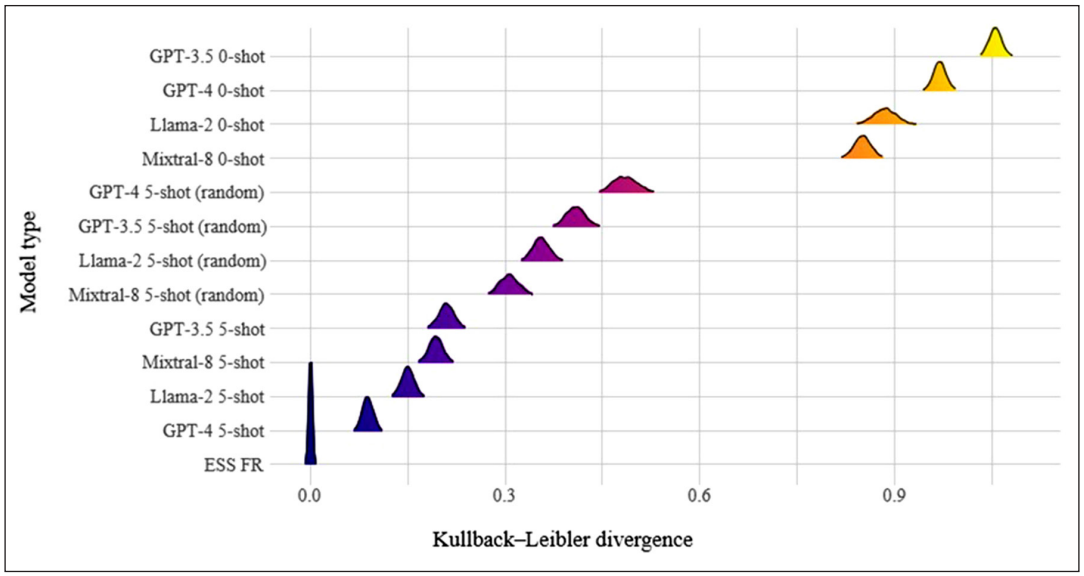

Figure 2 Bootstrap densities of Kullback–Leibler divergences between the distribution of answers for a question on political interest in the European Social Survey subsample of France (ESS FR) and the silicon samples generated by the tested LLMs with different prompting techniques

Horizontal axis: Kullback–Leibler divergence. Vertical axis: Density function value by model type and prompting technique, listing the combinations of various models, zero- and few-shot scenarios.

For the French subset (Figure 2), according to the Kullback-Leibler divergence results, the five-shot GPT-4-turbo performed significantly better than all other models, the second best was Llama-2-70b, the third was five-shot Mixtral-8x7B and the fourth was five-shot GPT-3.5-turbo, all with targeted examples. So, in this case, there was a clear difference between the five-shot prompting technique with targeted examples and the same setting with random examples. The next batch contained the five-shot settings with random examples with Mixtral-8x7B, Llama-2-70b, GPT-3.5-turbo, GPT-4-turbo. The last set of LLMs with zero-shot prompting technique performed significantly worse than the others.

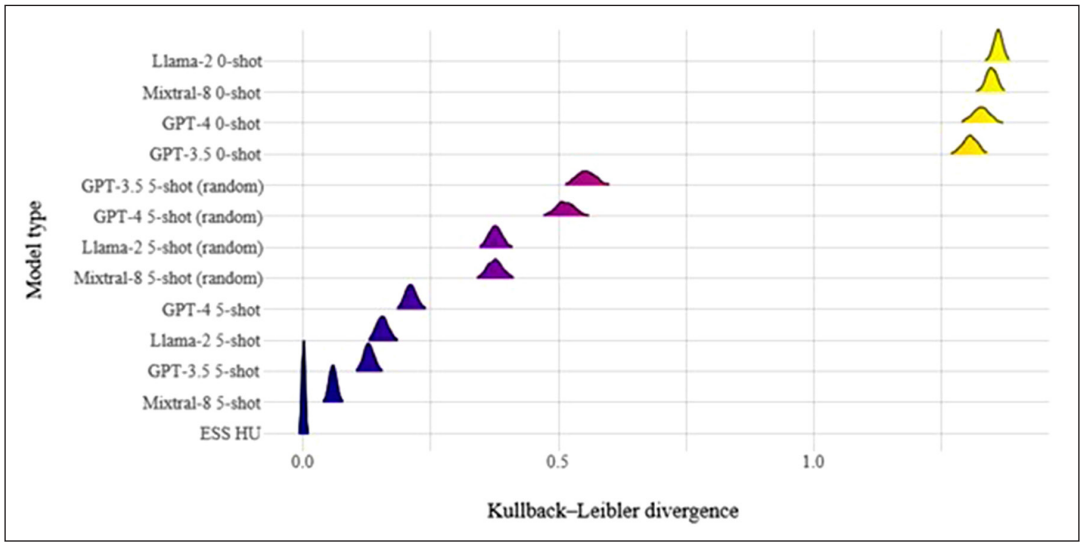

Figure 3 Bootstrap densities of Kullback–Leibler divergences between the distribution of answers for a question on political interest in the European Social Survey subsample of Hungary (ESS HU) and the silicon samples generated by the tested LLMs with different prompting techniques

Horizontal axis: Kullback-Leibler divergence. Vertical axis: Density function value by model type and prompting technique, listing the combinations of various models, zero- and few-shot scenarios.

For the Hungarian subset (Figure 3), according to the Kullback-Leibler divergence results, the five-shot Mixtral-8x7B was the closest to the original subsample, significantly better than all other models, the second best was GPT-3.5-turbo, the third was Llama-2-70b and the fourth was five-shot GPT-4-turbo, all of them with targeted examples. Similarly to the results on the French subsample, in this case, there was a clear difference between the five-shot prompting technique with targeted examples and the same setting with random examples, and for all three countries models performed the worst in the zero-shot setting.

Table 2 shows the best model generated distribution for each country. Even the best models consistently underrepresent extreme values, except for 'very interested' in Hungary. Comparing the sum of absolute differences between real and generated distributions, GPT-4-turbo for British data has a 30.5 per cent difference value, closely followed by GTP-4-turbo for French data with 33.5 per cent, while Mixtral-8x7B has a difference of 50.1 per cent for Hungarian data.

Table 2 Distribution of interest in politics in the real ESS data and from the best model for each country

Answer	ESS GB	GPT-4 5-shot	ESS FR	GPT-4 5-shot	ESS HU	Mix-tral-8x7B 5-shot
very interested	20.1%	16.2%	15.1%	11.7%	3.6%	6.8%
quite interested	43.8%	59.0%	24.2%	34.4%	21.6%	32.0%
hardly interested	22.1%	21.1%	40.6%	47.0%	45.1%	56.5%
not at all interested	14.0%	3.7%	20.1%	6.8%	29.7%	4.7%
Total	100%	100%	100%	100%	100%	100%

ESS: European Social Survey; GB: Great Britain; FR: France; HU: Hungary.

4 Regression coefficients

The standardized regression coefficients for tested models and prompting techniques also displayed differences in how well the silicon samples performed. Table 3 shows the regression results for the real data of the three subsamples. The estimated standardized coefficients with standard errors for all models and settings can be found in Appendix Table A4-6. The general pattern in the real data is that women are less interested in politics than men, as positive coefficients correspond to an increase in the predicted political interest value, which means a lower level of interest. Older, higher educated, and more left-leaning respondents tend to be more interested in politics than younger, less educated, and more right-leaning respondents.

Table 3 Regression coefficients and fit statistics for the subsamples of Great Britain, France, and Hungary in ESS.

Country	Great Britain		France		Hungary	
Variable	**Estimate**	**SE**	**Estimate**	**SE**	**Estimate**	**SE**
Gender	0.168	0.053	0.258	0.040	0.224	0.036
Age	−0.010	0.002	−0.011	0.001	−0.011	0.001
Education	−0.207	0.021	−0.293	0.018	−0.230	0.023
LR-scale	0.033	0.013	0.009	0.009	−0.034	0.008

The models predict interest in politics as a quasi-continuous outcome with gender, age, education (from 0 to 4, also a quasi-continuous variable), and self-placement on a left-right scale (LR-scale; Likert-scale from 0 to 10) as explanatory variables. p-values were all less than 0.001, except for LR-scale in GB with a value of 0.011, and in France with a value of 0.344.

Figures 4–6 show the UMAP projections of the bootstrap distributions for the regression coefficient vectors in the selected European countries (Great Britain, France, and Hungary, respectively), revealing that there is not a universally best model that replicates all coefficients equally well for all three subsamples. Note that UMAP does not necessarily preserve global relations between the distributions, comparisons should be made locally.

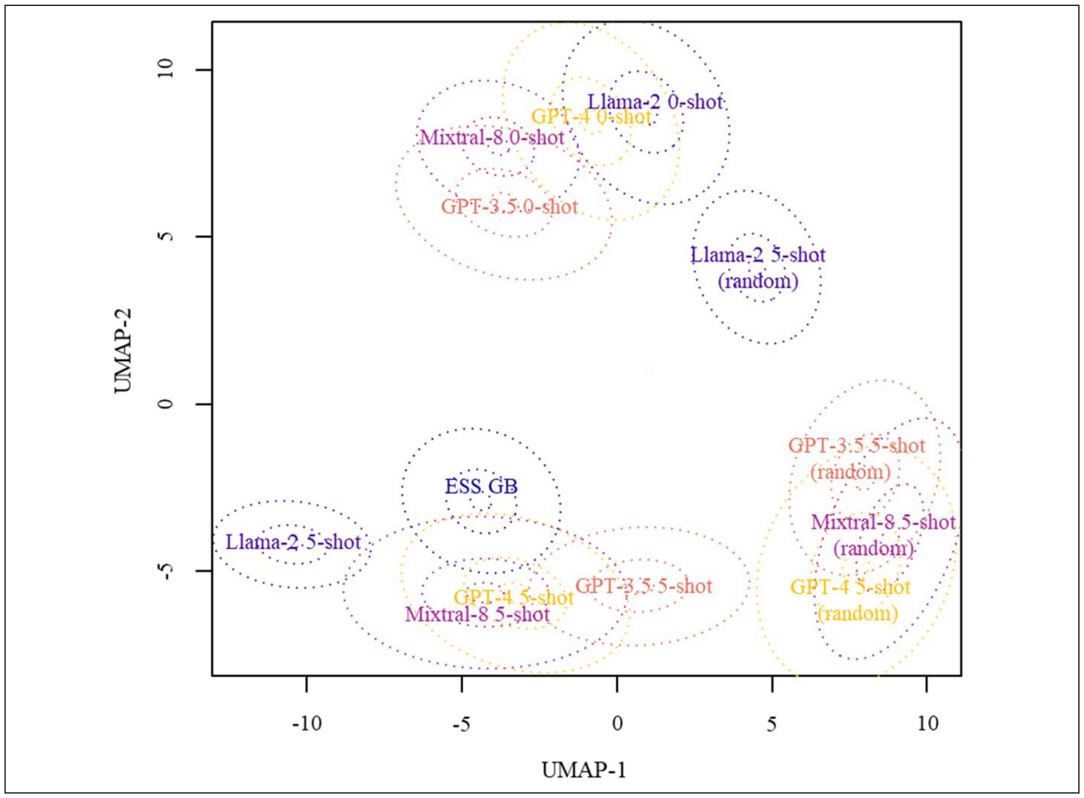

Figure 4 Comparison of the regression coefficients estimated from the European Social Survey subsample of Great Britain (ESS GB) with the ones from the silicon samples generated by the tested LLMs under different prompting techniques

The results are demonstrated in two dimensions, after applying UMAP. The horizontal dimension is highly correlated with the regression coefficient for age, while the vertical dimension is correlated with the coefficient for education. Dashed ellipses represent the 0.05, 0.55, and 0.95 percentiles of the bootstrap distribution of the coefficient vectors.

For the British subsample, five-shot GPT-4-turbo performed the best, five-shot GPT-3.5-turbo was second, while five-shot Mixtral-8x7B and five-shot Llama-2-70b were next. For five-shot models with random examples (see bottom, right-hand-side corner of Figure 4), we found that GPT-4-tubro, Mixtral-8x7B, and GPT-3.5-turbo performed similarly, while Llama-2-70b performed differently within that category and its virtual sample was closer to LLMs with zero-shot settings. All four model types with zero-shot prompting technique generated similar silicon samples, see upper section of Figure 4.

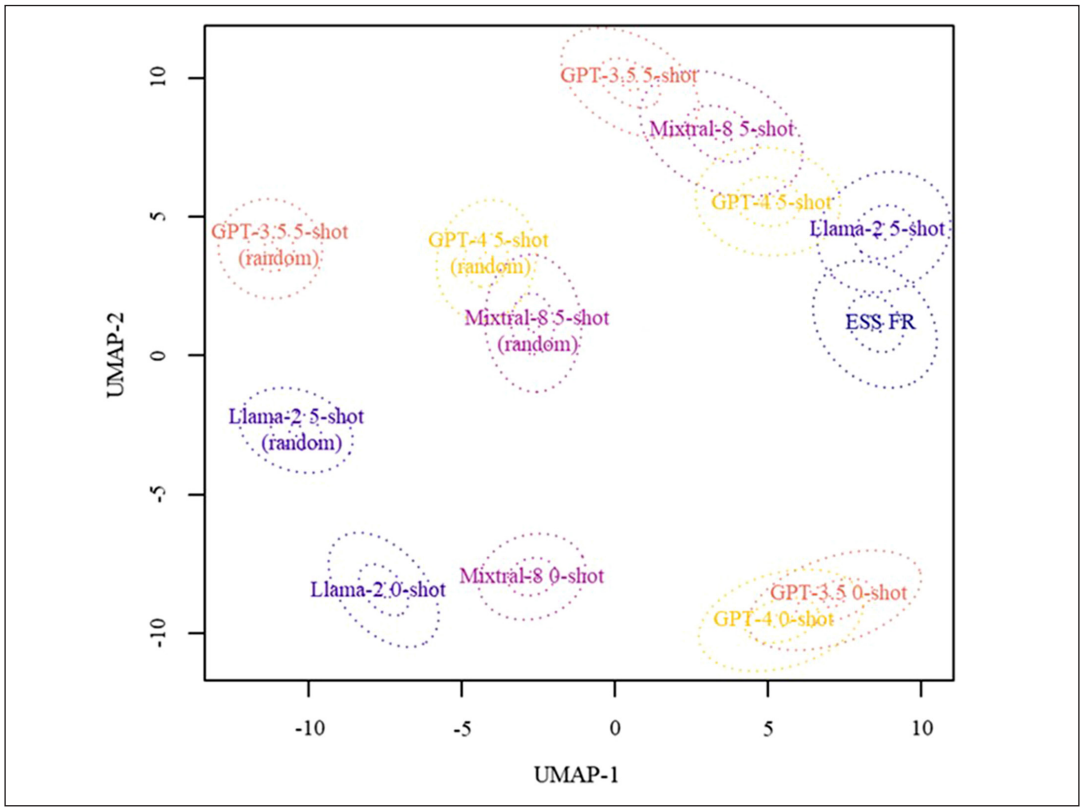

Figure 5 Comparison of the regression coefficients estimated from the European Social Survey subsample of France (ESS FR) with the ones from the silicon samples generated by the tested LLMs under different prompting techniques

The results are demonstrated in two dimensions, after applying UMAP. The horizontal dimension is highly correlated with the regression coefficient for age, while the vertical dimension is correlated with the coefficient for education. Dashed ellipses represent the 0.05, 0.55, and 0.95 percentiles of the bootstrap distribution of the coefficient vectors.

For the French subsample shown in Figure 5, the targeted five-shot Llama-2-70b performed the best, and five-shot GPT-4-turbo was second, with the other non-random five-shot models next (see upper right-hand-side corner of Figure 5). Neither the five-shot models with random examples, nor the zero-shot prompting technique produced regression coefficients close to the real ones.

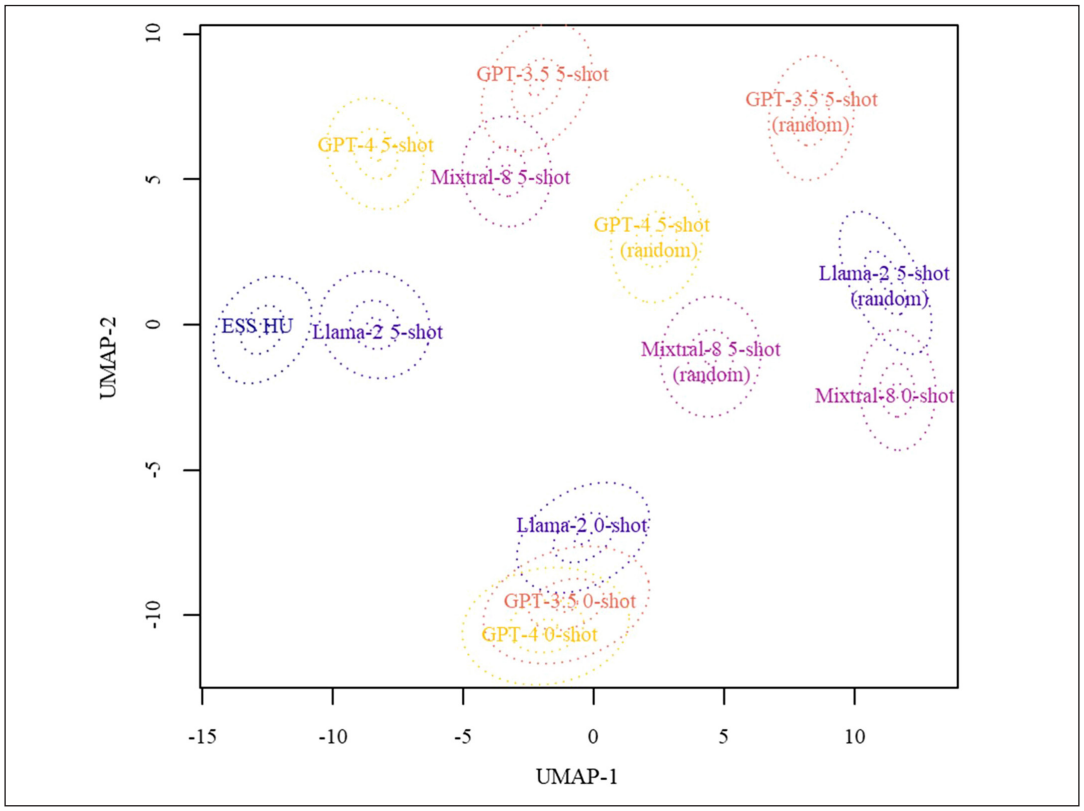

Figure 6 Comparison of the regression coefficients estimated from the European Social Survey subsample of Hungary (ESS HU) with the ones from the silicon samples generated by the tested LLMs under different prompting techniques

The results are demonstrated in two dimensions, after applying UMAP. The horizontal dimension is highly correlated with the regression coefficient for age, while the vertical dimension is correlated with the coefficient for education. Dashed ellipses represent the 0.05, 0.55, and 0.95 percentiles of the bootstrap distribution of the coefficient vectors

According to the results, for the Hungarian subsample shown in Figure 6, five-shot Llama-2-70b with targeted examples performed the best, and all others performed clearly worse.

Regression coefficients obtained from the models that yielded the most realistic values are shown Table 4. In all cases the pairs of coefficients are substantively similar, but the best models for this use case do not overlap with the ones we found for replicating the distribution of interest in politics alone.

Table 4 Unstandardized regression coefficients estimated from the real data and by the model with the most similar results for each country separately

Variable	ESS GB	Llama-2-70b 5-shot	ESS FR	Llama-2-70b 5-shot	ESS HU	GPT-4 5-shot
Gender	0.168	0.119	0.258	0.185	0.224	0.240
Age	−0.010	−0.011	−0.011	−0.010	−0.011	−0.011
Education	−0.207	−0.154	−0.293	−0.249	−0.230	−0.321
LR-scale	0.033	0.059	0.009	0.028	−0.034	−0.022

ESS: European Social Survey; GB: Great Britain; FR: France; HU: Hungary.

5 Impact of setup on performance

To assess the relative importance of the different components of the experimental setup, we have built a random forest model on the performance achieved as the Kullback–Leibler divergence from the original data with the different setups. Table 5 shows the relative importance of the factors involved in the tests. Importance of a setup component is measured with the mean decrease in mean squared error achieved by including that component in the model compared to omitting it. The shot type (zero- vs. five-shot) proved to be the most important determinant of performance by a large margin, while country was second, which accounts for the fact that the distribution of political interest was not the same in the three countries. The model used and the randomization of examples had the smallest effects.

Table 5 Relative importance values from the random forest model predicting the Kullback-Leibler divergence values comparing distributions for political interest in the real and simulated data

Variable	shot type	country	model	randomization
Importance	2.28	0.62	0.23	0.20

6 Summary and discussion

In this research note we aimed to explore the potential use of large language models in social science research, highlighting some of the capabilities and limitations of these models. We tested four current generation (as of early 2024) architectures: GPT-3.5-turbo, GPT-4-turbo, Llama-2-70b, Mixtral-8x7B with different prompting techniques by measuring their capacity to generate realistic data in a survey experiment. We used the British, French, and Hungarian subsamples from the 10th wave of the European Social Survey,

specifically the question about interest in politics, and the most important explanatory factors (gender, age, education level, and self-placement on a left–right scale) to create personas for the prompts that the models could use to give realistic answers.

In general, the results suggested that the tested LLMs had the capability to generate realistic answers when correctly prompted and could invoke the needed patterns from limited contextual information, but – in line with previous research – struggled in a zero-shot setting, without any problem-specific examples. Looking at the results in more detail, however, showed that there is not an unequivocally best model. While it was clear that to achieve good results providing the models with relevant examples had the largest impact, the exact model architecture was less important. The reason for this is not obvious, but there may be two important factors. The exact content of the training data for these models is not publicly available, but we assume that there is substantial overlap between training datasets of the different models, since all were reportedly trained on a large chunk of the internet (or at least its textual data) via CommonCrawl (commoncrawl.org) (Brown et al., 2020) and The Pile dataset (Gao et al., 2020). The other reason is that all four models share the defining feature of being autoregressive transformers (Radford et al., 2019; Vaswani et al., 2017). Even in this limited analysis, cross-country comparisons consistently favored Great Britain and France opposed to Hungary, which reinforced our initial idea based on published benchmarks, that languages with a larger user base are also more prominently represented in the training data of the models leading to better performance for tasks involving those languages, even though all prompts were given in English.

It must be noted that the reproducibility of the results may be jeopardized by the private companies hosting various versions of the tested models. GPTs are closed source models, OpenAI are both the developers and hosts, while Llama2 and Mixtral are open weights models, which means the trained model is available for anyone to host, but the training data and details of the training process are not open-sourced, prohibiting full reproducibility. This limitation is not of great concern for our research, as we do not aim to pinpoint an exact model and version to be used for the investigated tasks.

A potentially important aspect of the experiment that we are currently ignoring is the time component. The 10th wave of the ESS is a cross-sectional dataset that captures a well-defined timepoint, while the training data for the LLMs span a longer period. The latter is not precisely known but it is at least a decade based on the composition of The Pile dataset (Gao et al., 2020) which is part of the known training data of these models, although the general exponential trend of data created and represented on the internet (Li & Zhang, 2023) suggests that recent data dominate any large enough corpora needed to train such LLMs. We measured the temporal changes in the analyzed distributions looking at five waves of ESS from 6 (dated 2012) to 10 (dated 2022) to assess the potential impact of choosing the latest wave (see Table A7 and A8), and concluded that the values are stable enough in time, and there is no clear reason to prefer any other wave than the 10th or an average of an arbitrary number of waves.

To consider LLMs as viable respondents for survey, some problem-specific data is needed, and providing relevant examples is key – 'Language Models are Few-Shot Learners' as the title of the GPT-3 paper highlights (Brown et al., 2020). Examining the multivariate

associations through the regression coefficients, we found that there is no clear direction of bias for the investigated models. This reinforces the need for application and model specific evaluations. It is currently too early to draw conclusions on the scientific applications in which this methodology proves to be consistently reliable and valid, but there are many avenues for further research, even for this exact testing setup. We plan to expand the analysis of the silicon samples we have by investigating the patterns of answers in more detail, most importantly for open-ended questions. It is clear that models tended to default to certain answers, but it is less obvious whether generating a more faithful answer was dependent on the data structure of ESS (e.g., there is a higher variance in answers for certain personas) or model behavior (e.g., models tend to report higher political interest, because of the characteristics of the training data). To ensure a comprehensive analysis of LLMs, it is of course essential to approach their use in social scientific applications with a critical perspective and to acknowledge the limitations of the linguistic space of the internet in representing social reality. The main language of a country and the representation of that language on the internet most probably influenced the success of the models. Applications of LLMs in social science research should consider the limitations of these models and, if possible, provide solutions by acknowledging and correcting the known biases and caveats.

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Appendix

Table A1 Bootstrap p-values for the pairwise comparisons of KL distributions for the different test setups in the British subsample of ESS.

	Llama-2 0shot	**Mixtral-8x7B 0shot**	**gpt-3.5 0shot**	**gpt-4 0shot**	**Llama-2 5shot**	**Mixtral-8x7B 5shot**	**gpt-3.5 5shot**	**gpt-4 5shot**	**gpt-3.5 5shot rand**	**gpt-4 5shot rand**	**Llama-2 5shot rand**	**Mixtral-8x7B 5shot rand**
Llama-2 0shot	1	0.1365	0	0	0	0	0	0	0	0	0	0
Mixtral-8x7B 0shot	0.1365	1	0	0	0	0	0	0	0	0	0	0
gpt-3.5 0shot	0	0	1	0	0	0	0	0	0	0	0	0
gpt-4 0shot	0	0	0	1	0	0	0	0	0	0	0	0
Llama-2 5shot	0	0	0	0	1	0	0.0035	0	0.0095	0	0	0.001
Mixtral-8x7B 5shot	0	0	0	0	0	1	0.3645	0	0.403	0	0	0.4525
gpt-3.5 5shot	0	0	0	0	0.0035	0.3645	1	0	0.4715	0	0	0.3365
gpt-4 5shot	0	0	0	0	0	0	0	1	0	0	0	0
gpt-3.5 5shot rand	0	0	0	0	0.0095	0.403	0.4715	0	1	0	0	0.342
gpt-4 5shot rand	0	0	0	0	0	0	0	0	0	1	0.364	0
Llama-2 5shot rand	0	0	0	0	0	0	0	0	0	0.364	1	0
Mixtral-8x7B 5shot rand	0	0	0	0	0.001	0.4525	0.3365	0	0.342	0	0	1

Table A2 Bootstrap p-values for the pairwise comparisons of KL distributions for the different test setups in the French subsample of ESS.

	Llama-2 0shot	**Mixtral-8x7B 0shot**	**gpt-3.5 0shot**	**gpt-4 0shot**	**Llama-2 5shot**	**Mixtral-8x7B 5shot**	**gpt-3.5 5shot**	**gpt-4 5shot**	**gpt-3.5 5shot rand**	**gpt-4 5shot rand**	**Llama-2 5shot rand**	**Mixtral-8x7B 5shot rand**
Llama-2 0shot	1	0.0525	0	0	0	0	0	0	0	0	0	0
Mixtral-8x7B 0shot	0.0525	1	0	0	0	0	0	0	0	0	0	0
gpt-3.5 0shot	0	0	1	0	0	0	0	0	0	0	0	0
gpt-4 0shot	0	0	0	1	0	0	0	0	0	0	0	0
Llama-2 5shot	0	0	0	0	1	0	0	0	0	0	0	0
Mixtral-8x7B 5shot	0	0	0	0	0	1	0.0755	0	0	0	0	0
gpt-3.5 5shot	0	0	0	0	0	0.0755	1	0	0	0	0	0
gpt-4 5shot	0	0	0	0	0	0	0	1	0	0	0	0
gpt-3.5 5shot rand	0	0	0	0	0	0	0	0	1	0	0.0025	0
gpt-4 5shot rand	0	0	0	0	0	0	0	0	0	1	0	0
Llama-2 5shot rand	0	0	0	0	0	0	0	0	0.0025	0	1	0.0025
Mixtral-8x7B 5shot rand	0	0	0	0	0	0	0	0	0	0	0.0025	1

Table A3 Bootstrap p-values for the pairwise comparisons of KL distributions for the different test setups in the Hungarian subsample of ESS.

	Llama-2 0shot	**Mixtral-8x7B 0shot**	**gpt-3.5 0shot**	**gpt-4 0shot**	**Llama-2 5shot**	**Mixtral-8x7B 5shot**	**gpt-3.5 5shot**	**gpt-4 5shot**	**gpt-3.5 5shot rand**	**gpt-4 5shot rand**	**Llama-2 5shot rand**	**Mixtral-8x7B 5shot rand**
Llama-2 0shot	1	0.1875	0	0.044	0	0	0	0	0	0	0	0
Mixtral-8x7B 0shot	0.1875	1	0.007	0.1415	0	0	0	0	0	0	0	0
gpt-3.5 0shot	0	0.007	1	0.1645	0	0	0	0	0	0	0	0
gpt-4 0shot	0.044	0.1415	0.1645	1	0	0	0	0	0	0	0	0
Llama-2 5shot	0	0	0	0	1	0	0.0005	0	0	0	0	0
Mixtral-8x7B 5shot	0	0	0	0	0	1	0	0	0	0	0	0
gpt-3.5 5shot	0	0	0	0	0.0005	0	1	0	0	0	0	0
gpt-4 5shot	0	0	0	0	0	0	0	1	0	0	0	0
gpt-3.5 5shot rand	0	0	0	0	0	0	0	0	1	0.0425	0	0
gpt-4 5shot rand	0	0	0	0	0	0	0	0	0.0425	1	0	0
Llama-2 5shot rand	0	0	0	0	0	0	0	0	0	0	1	0.477
Mixtral-8x7B 5shot rand	0	0	0	0	0	0	0	0	0	0	0.477	1

Table A4 Standardized regression coefficients estimated from the ESS Great Britain subsample and the generated samples of the models (GPT-3.5-turbo, GPT-4-turbo, Llama-2-70b, Mixtral-8x7B) with different prompts (0-shot, 5-shot with random examples, 5-shot with closest examples from the data for the given characteristics) for political interest of the participants with gender, age, education, and political preferences on the left-right scale as explanatory variables.

Setup	Gender	SE Gender	Age	SE Age	Education	SE Education	LR-scale	SE LR-scale
ESS GB	0.088	0.027	−0.197	0.030	−0.290	0.029	0.073	0.030
Llama-2 0shot	0.036	0.029	−0.132	0.032	−0.106	0.032	0.122	0.049
Mixtral-8x7B 0shot	0.042	0.029	−0.031	0.032	−0.003	0.031	0.093	0.037
gpt-3.5 0shot	0.002	0.029	−0.086	0.028	0.006	0.031	0.111	0.061
gpt-4 0shot	0.070	0.030	−0.080	0.029	−0.079	0.032	0.110	0.053
Llama-2 5shot	0.091	0.026	−0.306	0.028	−0.315	0.028	0.192	0.033
Mixtral-8x7B 5shot	0.089	0.027	−0.207	0.029	−0.370	0.029	0.105	0.036
gpt-3.5 5shot	0.029	0.027	−0.150	0.027	−0.403	0.027	0.100	0.029
gpt-4 5shot	0.098	0.027	−0.190	0.028	−0.368	0.028	0.073	0.035
gpt-3.5 5shot rand	0.041	0.027	−0.052	0.030	−0.344	0.029	0.168	0.033
gpt-4 5shot rand	0.075	0.028	−0.044	0.031	−0.350	0.031	0.101	0.044
Llama-2 5shot rand	0.031	0.028	−0.013	0.028	−0.171	0.031	0.153	0.040
Mixtral-8x7B 5shot rand	0.083	0.026	−0.035	0.030	−0.373	0.029	0.142	0.044

Table A5 Standardized regression coefficients estimated from the ESS France subsample and the generated samples of the models (GPT-3.5-turbo, GPT-4-turbo, Llama-2-70b, Mixtral-8x7B) with different prompts (0-shot, 5-shot with random examples, 5-shot with closest examples from the data for the given characteristics) for political interest of the participants with gender, age, education, and political preferences on the left-right scale as explanatory variables.

Setup	Gender	SE Gender	Age	SE Age	Education	SE Education	LR-scale	SE LR-scale
ESS FR	0.133	0.020	−0.205	0.019	−0.347	0.021	0.020	0.023
Llama-2 0shot	−0.043	0.022	−0.010	0.024	−0.132	0.025	0.073	0.037
Mixtral-8x7B 0shot	0.016	0.023	0.014	0.024	−0.036	0.022	0.015	0.027
gpt-3.5 0shot	0.037	0.022	−0.158	0.022	0.003	0.024	0.082	0.037
gpt-4 0shot	0.015	0.022	−0.144	0.021	0.003	0.025	0.036	0.032
Llama-2 5shot	0.122	0.020	−0.247	0.019	−0.376	0.019	0.079	0.026
Mixtral-8x7B 5shot	0.127	0.020	−0.173	0.019	−0.434	0.020	0.072	0.027
gpt-3.5 5shot	0.066	0.020	−0.167	0.020	−0.424	0.019	0.035	0.022
gpt-4 5shot	0.150	0.019	−0.223	0.019	−0.440	0.019	0.054	0.026
gpt-3.5 5shot rand	0.007	0.020	0.038	0.023	−0.346	0.021	0.152	0.024
gpt-4 5shot rand	0.087	0.021	−0.043	0.022	−0.370	0.021	0.089	0.030
Llama-2 5shot rand	−0.009	0.022	0.008	0.023	−0.229	0.021	0.179	0.030
Mixtral-8x7B 5shot rand	0.090	0.019	−0.012	0.021	−0.418	0.018	0.130	0.031

Table A6 Standardized regression coefficients estimated from the ESS Hungary subsample and the generated samples of the models (GPT-3.5-turbo, GPT-4-turbo, Llama-2-70b, Mixtral-8x7B) with different prompts (0-shot, 5-shot with random examples, 5-shot with closest examples from the data for the given characteristics) for political interest of the participants with gender, age, education, and political preferences on the left-right scale as explanatory variables

Setup	Gender	SE Gender	Age	SE Age	Education	SE Education	LR-scale	SE LR-scale
ESS HU	0.134	0.021	−0.261	0.022	−0.218	0.022	−0.094	0.023
gpt-3.5 0shot	0.006	0.023	−0.084	0.021	−0.080	0.022	−0.157	0.039
gpt-4 0shot	−0.009	0.023	−0.061	0.023	−0.101	0.023	−0.174	0.039
Llama-2 0shot	−0.022	0.023	−0.056	0.024	−0.031	0.024	−0.124	0.037
Mixtral-8x7B 0shot	0.051	0.024	0.014	0.024	−0.141	0.022	−0.014	0.026
gpt-3.5 5shot	0.089	0.021	−0.187	0.024	−0.346	0.021	−0.039	0.023
gpt-4 5shot	0.157	0.020	−0.288	0.021	−0.332	0.020	−0.065	0.027
Llama-2 5shot	0.085	0.021	−0.280	0.023	−0.266	0.021	−0.016	0.028
Mixtral-8x7B 5shot	0.156	0.021	−0.191	0.023	−0.377	0.020	−0.011	0.024
gpt-3.5 5shot rand	0.030	0.022	−0.026	0.024	−0.290	0.022	0.070	0.027
gpt-4 5shot rand	0.116	0.021	−0.067	0.023	−0.305	0.019	−0.054	0.030
Llama-2 5shot rand	0.000	0.023	−0.014	0.023	−0.188	0.022	0.049	0.033
Mixtral-8x7B 5shot rand	0.103	0.021	−0.015	0.022	−0.365	0.020	0.030	0.028

Table A7 Descriptive statistics of the distribution of the political interest variable from ESS waves 6 to 10

Country	**Great Britain**		**France**		**Hungary**	
Answer category	ESS10	Mean (SD) of waves 6 to 10	ESS10	Mean (SD) of waves 6 to 10	ESS10	Mean (SD) of waves 6 to 10
very interested	20.1%	15.9% (2.6%)	15.1%	15.8% (1.2%)	3.6%	4.1% (0.6%)
quite interested	43.8%	41.4% (2.2%)	24.2%	28.7% (4.3%)	21.5%	23.1% (1.9%)
hardly interested	22.0%	25.2% (2.0%)	40.5%	36.9% (2.8%)	45.0%	40.0% (3.5%)
not at all interested	14.0%	17.5% (3.1%)	20.2%	18.6% (1.1%)	29.8%	32.8% (2.4%)

Table A8 Point estimates of regression coefficients from the 10th compared to the mean (SD) coefficients from waves 6 to 10.

Country	**Great Britain**		**France**		**Hungary**	
Variable	ESS10 estimate	Mean (SD) of waves 6 to 10	ESS10 estimate	Mean (SD) of waves 6 to 10	ESS10 estimate	Mean (SD) of waves 6 to 10
Gender	0.168	0.215 (0.059)	0.258	0.266 (0.023)	0.224	0.245 (0.078)
Age	−0.010	−0.009 (0.001)	−0.011	−0.009 (0.001)	−0.011	−0.010 (0.001)
Education	−0.207	−0.221 (0.027)	−0.293	−0.259 (0.019)	−0.230	−0.209 (0.030)
LR-scale	0.033	−0.004 (0.023)	0.009	0.001 (0.009)	−0.034	−0.044 (0.011)

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Beyond 'latent thematic structure': Expanding the interpretation of the topic model towards pragmatics

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Abstract

According to the textbook definition, a topic model aims to uncover the underlying topics of a corpus. Despite its widespread use across disciplines, the nature of these 'topics' has remained relatively underdefined. This research note attempts to fill this gap, drawing on empirical evidence to elucidate the practical application of the model. We argue that the frequency of terms within texts is influenced not only by their theme but also by factors such as genre and context, thus extending the notion of 'latent topics' beyond referential-semantic boundaries to include pragmatic considerations. Through case studies focusing on different genres, such as parliamentary speeches and online forums, we demonstrate the importance of pragmatics, which is often overlooked in well-known early applications that deal predominantly with formal written texts such as newspaper articles or academic papers.

Keywords: natural language processing, topic model, model interpretation, pragmatics

1 Problem statement

One of the best-known natural language processing (NLP) models, the topic model (Blei et al., 2003; Lafferty & Blei, 2009), aims to define the latent 'thematic structure' of a corpus of texts, i.e., to identify latent 'topics' based on the terms that occur in the texts. Many variants of the model have been developed over the last two decades and are widely used in a wide range of disciplines, but few papers have addressed the question of what is meant by 'thematic structure' and what exactly are the 'topics' that are identified. According to a recent systematic review, most researchers use topic models in a suboptimal manner due to the lack of methodologically elaborated interpretative protocols (Laureate et al., 2023). According to more profound criticism, topic modeling in its current form is usually based on 'unrealistic assumptions,' cannot be validated, does not model themes or content, and is uncontrollably affected by apophenia and confirmation bias (Shadrova, 2021).

While not so dismissive, we tend to agree with the direction of these criticisms: using topic models in social scientific research requires a lot of methodological and epistemological reflection to clarify the capabilities and limitations of the method. The present

paper aims to contribute to these reflections from the perspective of researchers who use topic models for analyzing various textual corpora. While working on various corpora, we have realized both the interpretative and epistemological uncertainties of topic models and attempted to find local solutions to emerging problems. In our experience, complementing quantitative results with iterations of qualitative analysis can help to decrease the above-mentioned uncertainties.

The purpose of this short research note is to explore these issues based on our empirical experience to support the practical use of the model. After presenting the views of some authors on this issue, we will argue that the higher/lower frequency of certain terms within texts depends not only on the narrowly defined topic/theme of the text but also on its form, genre, and context; 'latent topics' may therefore differ not only in referential-semantic terms (which is the narrow sense of 'topic,') but also in pragmatic terms. In the case studies to which we refer, we will see examples of both the role of genre (type of parliamentary speeches), the importance of word forms (the characteristically different roles of nouns and verbs), and, more generally, the usability of speech act theory in this context.

2 A heuristic description of the topic model

According to its authors (Blei et al., 2003; Lafferty & Blei, 2009), the topic model aims at identifying latent themes (in NLP terms, 'topics') in a corpus. Statistically, 'latent topics' are probability distributions over terms in the dictionary. The model attempts to maximize the distinctiveness of topics, i.e., it tries to distribute the words across topics in such a way that the topics are most clearly distinct from each other. A given topic can be identified by the terms that are most specific (most relevant) to it. For example, the co-occurrence of words such as water, farmland, plan, GMO, floods, and hectare in a subset of parliamentary speeches indicates that an agricultural topic is being discussed (see Németh et al., 2025). Thus, the co-occurrence of terms is important in identifying topics. Because of this property, the model stands in sharp contrast to dictionary-based approaches that examine the frequency of predefined dictionary items in texts; for example, political scientists' populist dictionaries used to identify populist politicians.

The topic model represents text with a simple 'bag of words' model that does not take into account word order or sentence tagging but maintains multiplicity, i.e., it keeps track of the number of times each term occurs in the whole text. Therefore, the model requires preprocessing of the text, such as the removal of punctuation and inflectional endings (stemming or lemmatization) as well as common words like conjunctions and articles (stopword removal), and the combining of frequently co-occurring terms and multi-element proper nouns into single terms (significant n-gram identification and named entity recognition).

One of the assumptions of the model is that there is a finite number of topics that 'generate' the texts. Texts can be identified as mixtures of topics, with as few topics as possible for a given text and as few characteristic terms as possible for a given topic. By estimating the parameters of the model, it is possible to find these topics (and the most relevant terms associated with them, i.e., words that are characteristic of the topics) and to estimate the extent to which a given text is associated with each topic (this is the topic

contribution indicator). The contents (labels) of the topics estimated by the model are then assigned to each topic by the researcher by interpreting the most relevant terms in the topics and by qualitatively processing the texts that are most representative of the topics in terms of their topic contribution. The relevance of a term (Sievert & Shirley, 2014) is defined as the sum of the topic-specific frequency of a term and a penalty term, which is an increasing function of the overall frequency of the term. Obviously, terms that occur frequently in a given topic but are also very frequent in the corpus as a whole are less relevant to the topic. Ideally, the interpretation is straightforward for the researcher who is familiar with the field, and the topics speak for themselves.

The number of topics is an input parameter of the model. One of the main aspects of fitting and interpreting topic models is, therefore, determining the 'correct' or rather 'optimal' number of topics. This decision can be justified objectively based on the number of clusters in cluster analysis. Choosing too low a number may lead to overly general topics, while choosing too high a number may lead to fragmented, redundant topics. Statistical metrics may also be used to support the decision, such as perplexity, which tests how successfully the model predicts new data, or various coherence metrics, which try to quantify the semantic similarity between the most relevant words in a given topic. The optimal number of topics is then determined by the maximum (or rather the local maximum) of the metrics computed for models with different numbers of topics. However, a mixed approach that also uses a qualitative assessment of the interpretability of the topics often yields better results when the qualitative assessment of the interpretability of the topics is also applied.

There are several different versions of the topic model, which differ in their statistical assumptions; historically, the first and perhaps most commonly used is Latent Dirichlet Allocation (LDA; Blei et al., 2003). More recent variants allow for the analysis of correlation between topics (correlated topic model) or variation over time (dynamic topic model) or different distributions by author (author topic model) or the impact of metadata on topic content (structural topic models), etc.

Exceptionally, in the field of text mining, this model has become popular not only in business but also in academia, namely, in humanities applications. Blei and his co-authors already recommended the method to humanists, and indeed, applications in this field appeared very early on – for example, historians have used it for historical journal analysis or diary analysis, and literary scholars for the analysis of poetic texts. The *Journal of Digital Humanities* devoted a special issue to the method as early as 2012.

To illustrate the productivity of the method, we will present a few applications that are characteristically different in terms of both subject and corpus. Mützel, in the Berlin project (2015), analyzed restaurant reviews of the city's restaurants going back 20 years. The LDA topic model helped to find changes in trends over a longer time span and also allowed the researcher to turn to the corpus qualitatively (through traditional reading) to find a turning point. The model revealed a dominant dynamic, namely that people had begun to pay more attention to the 'new German cuisine' than to local quality and atmosphere with a focus on regional and seasonal ingredients. Light and Cunningham (2016) looked at speeches given at the Nobel Peace Prize acceptance ceremony, which they argue are increasingly associated with globalization and neoliberalism, shifting from earlier (e.g., Christian) schemas. Blevins (2010) applied the method to the diary of Martha Ballard,

who lived in the 18th century. The diary contains almost 10,000 entries, so for a systematic overview, it is really helpful to have access to automated tools. The topics separated by the topic model were labeled with terms such as death, housework, and emotions, and it was seen, for example, that entries related to emotions became more frequent as the diary writer aged. An application in media studies is the work of Jacobi et al. (2016), who, from an analysis of *New York Times* articles on nuclear technology from 1945 to 2016, found that LDA is a very useful tool for the relatively fast content review of huge digital text corpora. Political scientist Grimmer (2010) examined how senators explain their work in Washington to voters by simultaneously examining the themes of media texts and senators' press releases. One of Grimmer's findings, which contradicts the theory of some political scientists, is that senators from the same state emphasize similar priorities in their press releases as senators from different states, and the author explains this by suggesting that senators from the same state may rely on similar constituencies. Finally, we present two articles that analyze speeches from the Hungarian Parliament (Németh et al., 2025, focusing on the parliamentary discourse of the Carpathian Basin; and Sik et al., 2024, analyzing the big picture of two decades of Parliament).

3 Previous considerations on the nature of the topics

The following brief scientific history of the introduction and diffusion of the topic model focuses on showing how the first, narrow semantic understanding of the concept of 'topic' necessarily became broader as a result of applications covering an ever wider spectrum and how it became necessary to include the dimension of pragmatics alongside the dimension of semantics in the definition of 'topic.'

In their first paper, the authors of the model take a technical approach to the nature of topics without mentioning any other approach to interpretation: 'We refer to the latent multinomial variables in the LDA model as topics […] so as to exploit text-oriented intuitions, but we make no epistemological claims regarding these latent variables beyond their utility in representing probability distributions on sets of words' (Blei et al., 2003, p. 996).

Later, in a co-authored paper (Lafferty & Blei, 2009), Blei presented the topic model variants using the example of the JSTOR scholarly journal archive, where topics are actually disciplines or sub-disciplines. Here, the presented application of the model operates within a narrow genre field (scientific articles), using a purely semantic approach without the need for a pragmatic dimension. It uses content as a synonym for topic ('To develop the necessary tools for exploring and browsing modern digital libraries, we require automated methods of organizing, managing, and delivering their contents,' p. 71) and refers to latent content structures ('finding useful structure in an otherwise unstructured collection,' p. 71; 'the hidden variables represent the latent topical structure,' p. 73).

Blei's later paper with sociologists is not only a methodological novelty but also an important work in cultural sociology, providing general research experience about the model from a less technical, more interpretation-validation-oriented approach. It is not only about latent themes but also about information reduction, and the importance of

interpretation is emphasized ('How can we capture the information we need, reduce its complexity, and provide interpretations that are substantively plausible and statistically validated?', DiMaggio et al., 2013, p. 570). New to the article are the concepts of framing and context, which go beyond the earlier technical semantics of topics ('In applications to the study of culture, substantive interpretability is crucial. Many topics may be viewed as frames (semantic contexts that prime particular associations or interpretations of a phenomenon in a reader) and employed accordingly', p. 578).

To our knowledge, this paper is the first to introduce the concept of relationality in meaning, providing an epistemological approach to the previous technical definition of the topic. According to the authors, meaning is relational in the sense that co-occurrences are important in assigning words to topics, and meanings are derived from these relations rather than from the words themselves. The paper cites structuralist linguistics and Saussure in this context, i.e., the original technical-statistical approach of the topic model is given a new, more complex interpretation in relation to concepts from other disciplines.

Schmiedel et al. (2019) relate the meaning of topics to the linguists' concept of distributional semantics (Firth, 1957) because, according to them, semantic similarities between linguistic items can be determined based on their distributional properties within a topic. This approach claims more than the relational model because it also implies that words occurring in the same context have similar meanings. It is worth noting here that word embedding models (Mikolov et al., 2013), which have gained much importance in recent years, also build on the distributional semantic approach to define vector spaces in which the location of a word depends on its corpus environment, i.e., its meaning. But here, the environment is defined using a small distance (only a few words), whereas topic modeling considers co-occurrences over a much wider range, typically a whole text. Therefore, the meaning relationship detected in topic modeling is less definitive than that defined in word embedding, and it is not possible to identify the meaning of words for topic models.

Blei et al. (2003) and others asserted the 'thematic coherence' of topics; however, the concept of 'coherence' also remained ill-defined in this research. However, later attempts were made to quantify coherence, e.g., Röder et al. (2015). Coherence measures always measure the semantic proximity of the relevant terms of a topic, where proximity is determined by an external reference corpus (e.g., Wikipedia). Röder et al. (2015) measured the validity of coherence metrics by human raters, not directly by going back to the original texts (i.e., by reading the texts belonging to a given topic and judging their coherence) but indirectly by assessing the semantic coherence of the relevant terms of the topic.

Gillings and Hardie (2023) and Brookes and McEnery (2019) have pointed out the shortcomings of this approach to the interpretation of topics, which can also be found in early applications (e.g., DiMaggio et al., 2013). They argue that word lists alone are of limited use for interpreting topics, and a traditional reading of the most representative texts is also necessary. This is supported by our own research experience (for a detailed description of our interpretation and validation procedure, see, e.g., Németh et al., 2021), and other users of topic models also often explicitly refer to mixing methods – see, e.g., Jacobs and Tschötschel (2019) or Chakrabarti and Frye (2017).

Shadrova (2021) gives one of the most comprehensive discussions of the epistemological problems of the nature of topics. Focusing on the claims relevant to the present paper,

she distinguishes the meaning of 'topic' according to the discipline in which it is used and sees a marked difference between, for example, information science, social sciences, and literary studies. According to Shadrova, information science understands topics as labels that can be used, for example, in the efficient classification of libraries; in the social sciences, a topic is the meaning derived from words that belong to similar semantic categories, while in literary studies, a topic is woven into a historical or societal context. As Shadrova claims, defining and quantifying co-occurrence in the interpretation of topics is a linguistically daunting task, requiring consideration of genre, text type, length, etc.

We will argue below that the role of societal context is also important in social science applications and that it is, therefore, simplistic to focus only on referential-semantic meaning in interpretation. Indeed, as we have seen in the brief literature review presented above, the first applications of the topic model were in the field of information science and were actually for classifying texts of the same genre (e.g., scientific articles). Moving out of this narrow framework – for example, into the field of cultural sociology – necessitated the use of the concepts of context and framing. After all, the fundamental interpretative challenges of hermeneutic social sciences, as elaborated by the founding fathers (e.g., Weber, 1949), are not rendered obsolete by the new analytical tools. The meaningful interpretation of textual data remains the task of a 'hermeneutic circle' (Grondin, 2015), regardless of whether the corpus consists of interviews or large-scale digital texts. To understand topics as semantic clusters, the 'whole' (represented by the key terms) can be understood from the perspective of the constitutive 'parts' (represented by the individual speech acts), and vice versa, the parts can be understood from the perspective of the whole. The iteration of these rounds of interpretation has the potential to reveal the 'thematic coherence' and fully explore the semantic and performative features of the topics. In what follows, we will show how the application of these principles enriches topic modeling: in our understanding, the semantics of topics indeed include genre and other pragmatic features that have important interpretative power in social science applications.

4 Summary of our research experience

4.1 The role of genre in Parliament

In a paper in the second part of this issue (Németh et al., 2025), we analyzed speeches in the Hungarian Parliament containing the term 'Kárpát-medence' (Carpathian Basin) using structural topic modeling. The term 'Kárpát-medence' is one of the most significant concepts in Hungarian geopolitical thinking, which also served irredentist goals in the period between the two world wars. The concept has been gradually revived in recent decades and is now part of everyday political discourse and national identity building. The stake of our research is that the concept of the Carpathian Basin is not a neutral concept, as it is charged with geopolitical intentions and is consciously used by actors in political discourse.

Parliamentary speeches have fixed types, and these types show important pragmatic differences. They can be classified into two main groups, according to Parliament's dual function (legislative and control). Keynote speeches, speeches, and pre-agenda speeches

usually have a legislative function, i.e., a representative function that reflects the main messages of the parties. Speeches with a control function are usually immediate questions, immediate answers, and two-minute speeches. Another important genre distinction is whether the text is pre-written or spontaneous. Finally, debates are also audience-oriented, as they take place in front of a real audience and a virtual audience of voters.

We found that, compared to the corpus as a whole, the Carpathian Basin sub-corpus is more likely to contain pre-written speeches, which have a legislative function and represent the main messages of the parties and are pre-written. In other words, the use of the term 'Carpathian Basin' is important for speakers when they want to represent their point of view, suggesting the strong ideological function of the term. Similarly, we identified a characteristic difference in the distribution of genres within the topics.

In our mixed-methods interpretation of the topics, we found that the importance of the speech function was most pronounced in the topics dealing with administrative and regulatory issues affecting Hungarians living beyond the borders. This topic turned out to be quite interactive and included controversial issues. For example, 'you' was among the most relevant terms, suggesting that there were often arguments about the topic, and 'don't be angry' was also a relevant term, suggesting even heated arguments ('don't be angry, but…' is a phrase that is commonly used in Hungarian when one party in a dispute disagrees with the other). The qualitative analysis also showed that the topic is often included in heated debates.

That is, according to our observation, topics can be characterized not only on a descriptive or semantic level but also on a pragmatic level. There are topics of a more performative nature concerning the function of Parliament as a context, where speech is part of political action and can therefore be approached as a speech act.

4.2 Speech acts in Parliament

The importance of speech acts was first pointed out by Austin (1962), who stressed the importance of the non-referential use of language and the many functions that utterances perform as part of interpersonal communication. Austin showed that many utterances do not convey information but have an action value; he called these utterances 'performatives' as opposed to 'constatives.' From this perspective, the three components of a speaker's utterance are locution (the semantic meaning of the utterance), illocution (the speaker's intention, the performative function), and perlocution (how the listener received it). This approach has also fertilized the social sciences; see, for example, Habermas (1984).

Our experience shows that this approach can be fruitfully used to interpret the topic model. The interpretation can, in the first step, focus on the semantic level of the text: at the level of the topics, one can analyze substantive themes that refer to the locutionary level. At the same time, it is worth looking at word types separately in order to identify other types of speech acts. Adjectives refer partly to moods and partly to the illocutionary and perlocutionary levels. If we look at topics that include verbs as relevant terms, we can find descriptive, argumentative, or performative speech acts. A qualitative analysis of the most representative texts can support the classification.

As an illustration, we first cite our paper (Sik et al., 2024), where we set out to map the Hungarian parliamentary discourses of the last two decades from the perspective of democratization using structural topic modeling. During the interpretation, we identified both substantive characteristics (i.e., what topics and framing appear) and the pragmatic-level characteristics of the text (how the topic is discussed). After interpreting each topic individually using both quantitative and qualitative approaches, we classified the topics into three groups according to their performative nature. The three groups differed both in their typical word-class patterns and in their speech-act function. The first group (labeled 'descriptive speech acts') was constituted of policy-based topics discussing specific economic, social policy, and administrative issues, mostly in a technocratic, descriptive manner. The relevant terms associated with the topics in this group were nouns (e.g., expenditure, transfer, contractor, taxpayer, resource-sharing, micro-region, inflation, tax cut, livestock, agroeconomics), indicating a highly specialized expert language. However, these topics were not only similar to each other on a substantive level but also on a pragmatic level: the hermeneutic analysis of the exemplary speeches revealed that the tone of these speech acts was relatively rational compared to the other clusters. Debates revolving around expert issues tended to maintain a rational basis, as the parliamentarians did not evaluate each other but relied on discursive frames of justification.

The second group was labeled 'confrontational, argumentative speech acts.' It consisted of controversial topics such as crises, financial crimes, political scandals, or the neuralgic points of memory politics. The group was characterized by emotionally charged adjectives and attributes (e.g., heroic, noble, authoritarian, beautiful, illegal). As the hermeneutic analysis of the speeches of this group revealed, the tone of these speeches was highly emotional: the MPs did not rely on the logic of justification but instead gave emotionally heated, divisive speeches.

The third group contained most of the verbs within their relevant terms; this cluster consisted mostly of performative speech acts that served an illocutionary function. According to the hermeneutic analysis of the speeches, the common core of these substantively diverse speech act patterns was performative functionality: linguistic patterns expressing hostility (terms such as 'lying,' 'lies,' 'stupid,' 'ashamed') and politeness (e.g., 'respected,' 'greet,' 'ask,' 'honors,' 'kindly') defined this cluster. In contrast to the neutral speech acts of the first group and the evaluative speech acts of the second group, the third group was characterized by performative speech acts with an illocutionary function. This means that the topics of the third group showed how actors interact with each other while discussing substantive and divisive issues.

We then analyzed changes in the frequency of these three clusters over the last two decades, discovering that the frequency of speech acts expressing the formal rules of parliamentary practice has gradually declined along with the performatives expressing democratic civic culture, while indicators of abusive communication have increased dramatically. In sum, the pragmatic analysis that complements the descriptive semantic level added a lot to the message of our paper. Note that this pragmatic approach to interpreting the topic model is so unusual that one reviewer of our paper even commented that a dictionary-based approach or supervised learning might be more effective for investigating the confrontational or emotional nature of texts.

4.3 Speech acts in online forums about depression

We also cite here another study based on the study of online forums because, in this context, interaction, i.e., pragmatics, plays a prominent role – as also shown in the interpretation of the topics.

We have analyzed online forums about depression in several articles (Németh et al., 2020; 2021; 2022; Sik et al., 2023). First, we would like to briefly refer to a paper that used supervised learning, i.e., not a topic model (Németh et al., 2022), just to prove the interpretative importance of the word types mentioned above. Here, the goal of the machine learner was to classify the posts according to whether they frame the mental state using a biomedical, psychological, or social approach. In the interpretation of the classification, we saw that the role of the word types was important, e.g., texts with more nouns (i.e., more formal in tone according to linguistic research) were more likely to be defined as biomedical framing – this is presumably due to the more objective nature of the approach.

In our research that analyzed forums using the LDA topic model (Németh et al., 2021; Sik et al., 2023), the first dividing line in the interpretation of the topics was not drawn according to semantic differences but according to performative differences. Performative differences were the communicative function of the posts and the illocutionary and perlocutionary dimensions of the speech act. Posts were interpreted as monologues that addressed different aspects of the world and the self, and as interactions that focused on exchange with others. Within these categories, further subtypes were distinguished: monologues included more objective attributions and emotionally charged self-disclosures (both dominated by locutionary content); interactions included more pragmatic consultations (dominated by locutionary content) and quasi-therapeutic engagements (dominated by perlocutionary content). Differentiating between these patterns at the illocutionary level proved to be particularly important for mapping the complex discursive processes of online depression forums. In addition to discussing the challenges of a depressed life and sharing experiences and available countermeasures, these platforms also host 'ritual healing' attempts performed by engaged helpers who have already struggled with depression. In order to grasp these more complex potentials, the hermeneutic analysis of the topics proved to be essential.

Regarding the final model, the two main dividing lines between topics were drawn according to their substantive content and communicative functions. A methodologically noteworthy result was that this interpretation was also consistent with the distance map of topics generated by the LDAvis function (Mabey, 2020), where topics are plotted on a two-dimensional plane; this consistency showed the robustness of our results. In the later paper (Sik et al., 2023), we took an explicitly dual approach to the interpretation of topics, defining both their semantic content and their pragmatic functionality.

5 Conclusions

There are several different versions of the topic model, and the articles in this special issue include some of them. The conclusions of this article can be applied to all these variants.

What 'topics' are identified in the topics? The examples above show that in making sense of topics, it is worth focusing on two things at once: the semantic side of the texts

(what are they talking about?) and the pragmatic side (how, for what purpose, with what effect on the audience?). We have also seen that it is worth applying speech act theory here, especially in social science research, where utterances are typically not just information carriers but actual actions that perform a variety of functions and have an impact on the speaker's environment as part of interpersonal communication. We have seen that in modeling the topics of online forums about depression, the topics can be interpreted along these two dimensions: the content of the posts and their communicative function. Similarly, in the study of Hungarian parliamentary speeches, the consideration of the genre and speech function of the texts has proved to be an important aspect.

Our case studies are based on less bounded genres (mostly spontaneous parliamentary speeches and online forums), where the importance of pragmatics is greater, but we believe that the majority of social research applications are based on just such informal genres. It is likely that the early and very widespread applications of the model did not emphasize this pragmatic aspect because they were mostly based on formal and written texts, such as newspaper articles (DiMaggio et al., 2013) or academic papers (Lafferty & Blei, 2009), so this aspect did not arise.

There are also methodological implications. On the one hand, we have drawn attention to the importance of paying attention to genre: genre-like information is available as metadata for many corpora.

On the other hand, we have seen how important the role of word forms is for speech acts – a result that highlights the risk of preprocessing decisions, such as word form filtering. In general, topic modeling is sensitive to the choice of preprocessing techniques (Grimmer & Stewart, 2013), and our analysis has shown why, for example, verb removal, which is a common procedure in general (Craswell et al., 2009) and in topic models in particular (Gautrais et al., 2017; Zirn & Stuckenschmidt, 2014), can lead to serious losses in terms of depth of interpretation and model validity.

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BOOK REVIEW

Grimmer, J., Roberts, M. E., & Stewart, B. M. (2022). Text as Data: A New Framework for Machine Learning and the Social Sciences. Princeton University Press

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Over the past decade, methods for analysing text as data have gained significant prominence in several fields, such as health, business, industry, but also in the social sciences and humanities. The increasing availability of large datasets, the development of advanced analytical techniques, and the decreasing costs of computational resources have collectively enhanced the capacity to extract valuable insights from textual data.

Authored by Justin Grimmer, Margaret E. Roberts, and Brandon M. Stewart, *Text as Data* is a valuable resource for researchers looking to leverage text as data in the social sciences, digital humanities and other fields where language is key to understanding human behaviour. Justin Grimmer is associate professor of political science at Stanford University. In the field of political science, his research has primarily focused on legislative communication and its influence on political representation. Margaret (Molly) Roberts's research focuses on the intersection of political methodology and information politics, with particular emphasis on automated content analysis and censorship in China. Her current work encompasses a range of projects, including investigations into censorship, propaganda, topic modelling, and advanced methods of text analysis. Brandon Stewart is an Associate Professor in the Department of Sociology at Princeton University. His research focuses on the development of novel quantitative statistical methods for application across the social sciences.

Each author possesses extensive expertise in data science, with a substantial background in the field. They have produced leading work in the field of data science that spans a diverse range of subjects within both American and international politics (Grimmer, 2010; Grimmer & Stewart, 2013; Roberts et al., 2014). Through the application of computational methods, they have produced and validated numerous novel insights into the nature, causes and consequences of political communication. Their work exemplifies the potential of treating text as data to substantially advance various domains of social science research.

In recent years, the cost of analysing vast collections of texts has undergone a dramatic reduction leading to remarkable advancements across various disciplines. Social scientists, digital humanities scholars and industry professionals now regularly leverage

large-scale document corpora. This shift is attributable, in part, to technological developments, but additionally, methodological innovations have played a crucial role. A growing body of literature – originating in computer science and computational linguistics, and subsequently expanding into social sciences and digital humanities – has introduced tools, models and software that facilitate large-scale text analysis and organization. The origins of this development trace back to the late 1980s and early 1990s, when first statistical techniques, such as latent semantic indexing, emerged, enabling the complex analysis of larger text corpora (Miner et. al., 2012). However, the widespread adoption of these methods occurred primarily after 2000, as newer techniques for processing the rapidly expanding volume of digital content were introduced (Liu, 2015).

According to the 'Text as Data' approach, textual data is treated as an organized, structured file, formatted within a numerical database to serve as input for computational algorithms (Gentzkow et al., 2019). These algorithms either first developed in computer science or built closely on those developments. For instance, within political science, scholars have employed topic models (Blei et al., 2003; Grimmer, 2010; Roberts et al., 2013) as well as supervised learning algorithms for document classification (Stewart & Zhukov, 2009; Pan & Chen, 2018). However, according to the authors, the knowledge transfer from computer science and related fields has created confusion in how text as data models are applied, how they are validated, and how their output is interpreted. This confusion emerges because tasks in academic computer science are different than the tasks in social science, the digital humanities, and even parts of industry. While computer scientists are often (but not exclusively!) 'interested in information retrieval, recommendation systems, and benchmark linguistic tasks, a different community is interested in using "text as data" to learn about previously studied phenomena such as in social science, literature, and history' (p. 23).

A large dataset of texts alone is insufficient; it is essential to formulate relevant research questions and derive meaningful answers. Additionally, one must demonstrate the limitations of the data's validity and account for potential sample biases and distortions. This book aims to illustrate how to treat 'text as data' for *social science tasks* and *social science problems*. It adopts a six-part structure, combined with several chapters and subchapters. Each part is structured around five fundamental concepts: representation, discovery, measurement, prediction and causal inference. Part I (Chapters 1–2) presents a comprehensive overview of how computational methods, particularly text analysis, are transforming social science research. It emphasizes the shift from traditional deductive approaches to more iterative and data-driven processes, where researchers engage in cycles of discovery, measurement, and inference. The part outlines the stages of the research process – discovery, measurement, and inference – explaining how text analysis can contribute at each stage. It also emphasizes that while computational methods are powerful, they cannot replace human judgment. Instead, these methods augment human capacity by helping researchers uncover insights that can be interpreted through theoretical frameworks.

Chapter 2 is built around six core principles of text analysis, which guide the application of computational methods to social science research. These principles underscore the critical role of theory, human expertise, and iterative processes in social science research. They highlight the complementary function of computational text analysis, which enhances rather than supplants human judgment. By integrating computational tools into

the research process, scholars are able to analyse large textual datasets more efficiently while still relying on theoretical frameworks and expert interpretation to guide their analysis and draw meaningful conclusions.

Part II (Chapters 3–9) delves into the fundamental phase of the research process: 'Selection and Representation.' Chapter 3 establishes key principles for selecting and representing texts as data, providing the theoretical grounding for subsequent discussions. Chapter 4 is particularly significant as it emphasizes the importance of corpus selection, framing it as a fundamental step that can shape the outcome of research. This chapter addresses four prevalent forms of sample selection bias – resource bias, incentive bias, medium bias, and retrieved bias – that can impact the representativeness of the textual corpus. These biases impact which voices or texts are included, often reflecting power structures or accessibility limitations. Chapters 5 through 7 explore various approaches to word representation, beginning with the traditional 'bag of words' model (Chapter 5), followed by the probabilistic 'multinomial language model' (Chapter 6), and the algorithmic 'vector space model' (Chapter 7). Since these models do not account for the contextual relationships and semantic similarities between words, Chapter 8 introduces the 'word embeddings' model, which provides distributed representations that capture such nuances. Finally, Chapter 9 reviews additional methods of text representation, focusing on language sequences that encode both the syntactic and semantic roles of words, illustrated through a range of examples.

Part III (10–14) delineates the initial core task within the social research process, termed 'Discovery,' a concept that is often overlooked in quantitative research methodologies. This section elucidates how models that treat 'text as data' can enhance both conceptual discovery and theoretical innovation in the social sciences. The discussion begins with an introduction to the concept of 'discovery' and the presentation of four foundational principles that should guide this process: context relevance, the absence of a definitive ground truth, the importance of evaluating the concept rather than the method, and the advantages of utilizing separate data sources (Chapter 10). These principles establish a framework for researchers to navigate the complexities inherent in textual analysis. Following this foundational chapter, Chapter 11 introduces keyword analysis methods, which focus on identifying discriminating words. These methods are characterized as relatively simple yet powerful techniques for uncovering the distinctive features of documents, facilitating deeper insights into their content and context. Subsequent chapters (12–14) expand upon the theme of organizational discovery within texts, presenting three distinct methodologies for text categorization. Chapter 12 discusses unsupervised clustering analysis, which groups texts based on inherent patterns without pre-defined labels. Chapter 13 introduces mixed membership topic models, which allow for a nuanced understanding of the various topics present within a single document, thereby acknowledging the complexity of textual data. Finally, Chapter 14 explores low-dimensional document embeddings, a technique that represents documents in a condensed vector space, enabling efficient comparisons and analyses across large corpora.

Part IV of the text (Chapters 15–21) focuses on the second core task in social science research: 'Measurement,' which involves quantifying conceptualizations that have been discovered. The section begins by outlining five foundational principles for effective

measurement: clear goals, identifiable source material, an explainable and reproducible coding process, validated measures, and documented limitations (Chapter 15). Following this, Chapter 16 introduces the simplest measurement method – 'word counting.' Chapter 17 provides an overview of supervised classification methods, while Chapters 18–20 delve into specific components of this approach. Chapter 18 addresses coding a training set, Chapter 19 discusses classifying documents with supervised learning, and Chapter 20 evaluates the performance of classification models. The final chapter (Chapter 21) emphasizes the application of discovery methods to measurement and the critical importance of extensive validation in both supervised and unsupervised models. This validation is essential for confirming the accuracy and reliability of measurement results, thereby enhancing the credibility of research findings. Overall, Part IV establishes rigorous standards for measurement in social science research, ensuring clarity, reproducibility, and validation in the quantification of concepts.

Part V of the text (Chapters 22–27) addresses the final stage of the social research process – 'Inference,' which encompasses prediction and causal inference. Chapter 22 introduces general principles of inference and differentiates the concept of 'prediction' from 'causal inference.' Chapter 23 outlines four major types of predictive tasks: source prediction, linguistic prediction, social prediction, and nowcasting. While prediction has become increasingly important in the social sciences, many research projects ultimately aim for causal inference. Chapter 24 provides an in-depth examination of causal inference, clarifying its relationship with prediction and measurement, and establishing key principles for applying causal inference in textual analysis. Chapters 25–27 further explore the application of text data in experimental settings, detailing its use as an outcome, a treatment, and a confounder. Together, these chapters underscore the importance of inference in social research, highlighting the methodologies that enable researchers to derive meaningful conclusions from textual data.

Part VI (Chapter 28) is the concluding part of this book. It reaffirms the principles articulated in earlier chapters, which collectively validate text as data methods as a robust tool for advancing research within the social sciences. However, the chapter emphasizes that, despite the apparent power and promise of these methodologies, they cannot wholly supplant human analytical capabilities or address the fundamental challenges inherent in social science research. Issues such as threats to inference – including confounding variables, reverse causality, and dependence – persist regardless of the analytical techniques employed. Consequently, the application of text as data methods must be approached with careful consideration and a sense of modesty, recognizing both their potential and limitations in the pursuit of meaningful social science inquiry.

In articulating my personal experience with the book, I find it most fitting to commence with the title of one of its subsections. In the introductory subsection titled 'What This Book Is Not,' the authors clarify the primary focus of the book, emphasizing that it is centred on research design rather than the technical intricacies of contemporary methods or software applications. The authors explicitly delineate their objective: to utilize textual analysis as a means of addressing questions pertaining to social data. This approach may leave readers seeking immediate, practical coding examples or a comprehensive examination of specific technical methodologies feeling dissatisfied. By establishing this frame-

work, the authors set a clear expectation for the reader, directing attention towards the conceptual underpinnings of research design in text analysis rather than providing a technical manual.

However, this position is, I believe, correct and justifiable. There are many manuals of a technical nature. But the integration of the 'text as data' approach in social research, the place of new methods among the existing ones are rarely discussed. Rather than technological innovations, the book discusses the challenges of using computational methods that are integrated into existing paradigms of social research: the critical role of theory and human expertise, the complementary function of computational text analysis, distinction of prediction and causal inference etc. That is, the book looks at the technological innovation in IT from the perspectives of social research. As the authors write: 'a central argument of this book is that the goal of text as data research differs from the goals of computer science work' (p. 5). In this respect, this work is unique and fills an important gap.

Overall, Text as Data emphasizes the treatment of 'text as data' within the context of social science tasks and problems, providing illustrative examples throughout. Additionally, it serves as a comprehensive guide for researchers, delineating the capabilities and limitations inherent in text data methodologies. The text facilitates readers' familiarity with the diverse range of tasks that text data methods can effectively address, thereby enhancing their understanding of the potential applications in social science research.

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